

The effect of organisational cultures and subcultures on enterprise system implementation

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Abstract

Enterprise systems (ES) are important cross-business software that can be difficult to implement. A key factor impacting ES implementation lies with the influence of organisational cultures and subcultures which may enable or hinder such implementations. Existing research has focused on culture as being a stable, homogenous variable and little consideration has been given to the dynamics of cultural and organisational change during ES implementations. This study uses eight cultural dimensions (Detert et al, 2000) to examine instances of dialectic conflict between opposing cultural values and how these can impact ES implementations. This study uses data drawn from four case studies of large organisations that had implemented ES. The results identified five cultural dimensions where there was evidence of a cultural conflict between each organisation and the ES implementation. The results also found evidence that different subcultures within the organisation operated in different ways to facilitate or impede the adoption of the system. The evidence showed that the implementations resulted in cultural changes within each organisation to reflect the values embedded in the ES. This research therefore provides valuable insights into the cultural effects of large-scale implementations at an organisational level and shows that such effects are not necessarily homogenous and may vary due to the cultural values of subgroups involved.

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Table of contents

The effect of organisational cultures and subcultures on enterprise system implementation	1
Abstract	3
Acknowledgements	5
Table of contents	7
List of tables.....	11
List of figures	12
List of abbreviations	13
Chapter 1 Introduction	15
1.1 Organisational culture and ES implementation	16
1.2 Cultural fit.....	17
1.3 Cultural dialectics	17
1.2 Research Question.....	19
1.3 Justification.....	20
1.4 Contribution	23
1.4.1 Theoretical Contributions.....	23
1.4.2 Practical Contributions	25
1.5 Chapter Outline	27
Chapter 2 Literature Review.....	29
2.1 Culture	31
2.1.1 National Culture	32
2.1.2 Organisational Culture.....	33
2.2 Organisational culture and ES implementation	37
2.2.1 Cultural fit.....	39
2.2.2 Cultural homogeneity and subcultures	43
2.2.3 Cultural dialectics	47
2.3 Social shaping of technology	53
2.4 User resistance	57
2.5 Implementation process models	60
2.5.1 Pre-implementation Stage.....	61
2.5.2 Implementation Stage	62
2.5.3 Post-implementation Stage	63
2.5.4 Summary.....	64

2.6 Conclusions.....	64
Chapter 3 Methodology	69
3.1 Epistemological Statement.....	69
3.2 Research Design	70
3.2.1 Development of research question	73
3.2.2 A priori specification of constructs.....	73
3.2.3 Unit of analysis	73
3.2.4 Case selection	74
3.2.5 Development of case study protocol	75
3.3 Data Collection	75
3.3.1 Case 1 – Omega SMS implementation at Southern University	78
3.3.2 Case 2 – ResultSys Implementation	79
3.3.3 Case 3 – FoodCo’s SAP implementation.....	81
3.3.4 Case 4 – Southern City Council’s SAP Parks module	82
3.4 Data Analysis	83
3.4.1 Early analysis	83
3.4.2 Coding.....	83
3.4.3 Dialectic analysis.....	85
3.4.4 Cross-case analysis	86
Chapter 4 Results.....	87
4.1 Case Study 1 – Southern University’s Implementation of the Omega SMS	87
4.1.1 Analysis of dimensions	90
4.1.2 Other dimensions	114
4.1.3 Summary.....	122
4.2 Case Study 2 – SAHB’s Implementation of ResultSys	123
4.2.1 Analysis of dimensions	126
4.2.2 Other dimensions	139
4.2.3 Summary.....	147
4.3 Case Study 3 – FoodCo’s implementation of SAP	149
4.3.1 Analysis of dimensions	151
4.3.2 Other dimensions	167
4.3.3 Summary.....	174
4.4 Case Study 4 – SCC’s SAP enhancement.....	175
4.4.1 Analysis of dimensions	178

4.4.2 Other dimensions	196
4.4.3 Summary.....	202
4.5 Cross-case Analysis	204
4.5.1 Stability versus change	205
4.5.2 Centralisation versus autonomy.....	208
4.5.3 Isolation versus collaboration	211
4.5.4 Hard data versus personal experience	214
4.5.5 External versus internal motivation	215
4.5.6 Process versus results.....	216
4.5.7 Internal versus external change	219
4.5.8 Short term versus long term.....	221
4.5.9 Post-hoc analysis of customisations and configurations on system benefits	222
4.5.10 Summary.....	225
Chapter 5 Discussion	229
5.1 Cultural Fit	234
5.2 Dialectics and social shaping of organisations	237
5.3 Cultural homogeneity and subcultures	240
5.4 Model development	242
5.5 Applying the dialectic forces model of ES implementations.....	248
5.5.1 CS1 – Southern University	248
5.5.2 CS2 – SAHB	250
5.5.3 CS3 – FoodCo	251
5.5.4 CS4 – SCC	252
Chapter 6 Conclusions	255
6.1 Implications for researchers.....	255
6.1.1 Cultural fit.....	255
6.1.2 Cultural homogeneity & subcultures.....	256
6.1.3 Dialectics, social shaping and cultural change	256
6.1.4 Dialectic forces model of ES implementations (DFM Model)	258
6.2 Implications for practitioners	258
6.2.1 Cultural analysis of fit	259
6.2.2 Creating cultural fit.....	261
Vendors.....	262
6.3 Limitations	263

6.4 Conclusions.....	265
References	269
Appendix.....	279
1. Introductory letter to introduce research project	279
2. Case Study Questions	280
3. Nvivo Screenshot.....	285

List of tables

Table 2.1 The Eight Organisational Culture Dimensions from Detert et al (2000).....	35
Table 3.1 – SU respondents and implementation stages they were involved with.....	79
Table 3.2 – SAHB respondents and implementation stages they were involved with	80
Table 3.3 - FoodCo respondents and implementation stages they were involved with.....	82
Table 3.4 – SCC respondents and implementation stages they were involved with	83
Table 4.1 - Key cultural dimensions from SU case study.....	91
Table 4.2 - Key cultural dimensions from SAHB case study	127
Table 4.3 - Key cultural dimensions from FoodCo case study.....	152
Table 4.4 - Key cultural dimensions from SCC case study	179
Table 4.5 - Key cultural dimensions from each individual case study.....	205
Table 4.6 - Cross-case results for Orientation to change	206
Table 4.7 - Cross-case results for Control, coordination and responsibility.....	209
Table 4.8 - Cross-case results for orientation to collaboration	212
Table 4.9 - Cross-case results for Basis of truth and rationality.....	214
Table 4.10 - Cross-case results for Orientation to Work.....	217
Table 4.11 - Cross-case results for Orientation and Focus.....	219
Table 5.1 - Cross-case summary of results	232

List of figures

Figure 2.1 Van de Ven and Poole's (1995) Dialectic Model.....	49
Figure 5.1 - Dialectic Forces Model of ES Implementations.....	243
Figure 5.2 - CS1 analysis on the dialectic forces model of ES implementations	249
Figure 5.3 - CS2 analysis on the dialectic forces model of ES implementations	250
Figure 5.4 - CS3 analysis on the dialectic forces model of ES implementations	251
Figure 5.5 - CS4 analysis on the dialectic forces model of ES implementations	253

List of abbreviations

AHB	Area health board
AM	Asset management
B2B	Business to business
BLCE	Balance
CAPEX	Capital expenditures committee
CBD	Component based development
CEO	Chief executive officer
CHNG	Change
CIO	Chief information officer
CIS	Clinical information systems
CM	Contract manager
CMO	Chief medical officer
CNFL	Conflict
COO	Chief operating officer
CRM	Customer relationship management (systems)
CSF	Critical success factor
CVF	Competing values framework
CWW	City waste and water
ECM	Electronic content management
EFTS	Equivalent fulltime student
ERP	Enterprise resource planning (systems)
ES	Enterprise systems
GIS	Geographic information system
GM	General manager
GP	General practitioner
HIS	Health information system
HOD	Head of department
IAMS	International asset management standards
IS	Information systems
IT	Information technology
JDE	JD Edwards
KMS	Knowledge management system

KPI	Key performance indicator
LGA	Local Governments Act
LOINC	Logical observation identifiers names and codes
MOE	Ministry of education
NAHB	Northern area health board
OC	Organisational culture
PBRF	Public benefit research funding
PD	Project director
PM	Project manager
POS	Point of sale system
PVC	Pro vice-chancellor
RFP	Request for proposal
SAHB	Southern area health board
SA	Student administration
SAP	Systemanalyse und programmentwicklung
SCC	Southern city council
SCOT	Social construction of technology
SIT	Social identity theory
SME	Subject matter expert
SQAG	Southern quality assurance group
SST	Social shaping of technology
SU	Southern University
TMSC	Top management support and championship
TQM	Total quality management
UEG	Urban environment group
VC	Vice chancellor
VLE	Virtual learning environment
VMI	Vendor managed inventory
WMS	Warehouse management system

Chapter 1 Introduction

Enterprise systems (ES) are important business software for organisations as they enable the integration of business processes and sharing of resources across an organisation (Markus and Tanis 1999; Jones et al. 2006). Increasing numbers of organisations are installing ES modules or upgrading to full ES with one estimate suggesting that the ES market will reach \$120 billion in 2012 (Gartner, 2012). However, implementing an ES is a major undertaking and businesses are losing billions of dollars annually in ES implementations that have failed or fallen short on delivering expected reductions in costs and increased profitability (Zhang et al. 2005). Because large ES implementation projects will typically cut across departmental, organisational and even geographic boundaries there is increasing awareness that organisational culture plays a major role in ES success or failure (Krumbholz et al, 2000).

Culture has been defined by Schein (1985) as the basic assumptions, values and artefacts of a group of people which influences how they view the world and behave. Research on ES and culture has emphasized the importance of cultural fit between the ES and the organisation for ES implementation success (Wang et al, 2006). However, there is a need for more research to examine the cultural dynamics present in ES implementations including cultural fit and the impact of organisational culture (OC) and subcultures. Cultural fit reflects the extent to which the organisation may need to change its culture to support ES implementation and/or how the ES may be changed to fit the organisation (Strong and Volkoff, 2010). Indeed, researchers have found that particular value orientations may predispose certain groups towards favourable or unfavourable adoption of ES (e.g. Klaus et al, 2010). Indeed, where subcultures hold different values there can be tensions within the implementation which can be the basis for cultural change. Thus, there have been calls for research to more closely examine the effect of subcultural values and how these cultural dynamics can impact ES implementations and cultural change over time (Jackson, 2011).

This research seeks to address this gap by conducting in-depth case studies of four organisations using dialectic analysis to try to understand the forces at play between the ES and each organisation (e.g., Van de Ven & Poole, 1995; Robey et al, 2002). Large ES implementations represent an excellent context for examining cultural dynamics because they can have broad effects across the organisation, impacting the organisation's culture as a whole as opposed to the more localised, individual or group level effects of smaller

systems (Strong & Volkoff, 2010). The use of dialectic analysis to examine an ES implementation can also show the cultural changes or system changes that may be the result of struggles between different values. This can show how cultural change may result from an ES implementation impacting the many facets of the organisation.

This introduction will provide a brief overview of the literature review of this study, outline the research question and provide justifications and contributions. First, organisational culture and ES implementation is examined which introduces key concepts related to ES systems and organisational culture. Second, the literature around cultural fit is reviewed which shows that conflicts can arise between ES and organisations due to mismatches in cultural values. The thesis then examines and introduces the concept of cultural dialectics which provides the main analysis tool that is used in this research. Following this, the research question is explained, justified and the expected contributions of this study are discussed. Finally, the chapter outline is presented.

1.1 Organisational culture and ES implementation

Enterprise systems (ES) can be defined as commercial software packages that enable the integration of business processes and transaction-oriented data throughout the organisation (Markus et al, 2000). ES can include large, integrated, process-oriented, packages such as ERP systems that have been designed to meet the needs of different organisational functions such as accounting and control, manufacturing and distribution, and sales and order entry (Strong & Volkoff, 2010).

In this thesis we focus on organisational culture (OC) and adopt a value-based perspective on OC. This is because values are considered more observable than beliefs, and more decipherable than symbols or artefacts (Schein, 1985). This focus on values is widely evidenced in national level studies that focus on a select group of cultural values (e.g. Hofstede, 2001) and in organisational level studies which have identified a much greater number of cultural values (Leidner & Kayworth, 2006).

Researchers have also struggled over how to define and measure the concept of culture (see Quinn & Rohrbaugh, 1983). Using a qualitative approach Detert et al (2000) identified eight OC dimensions: Orientation to Change, Control, Coordination and Responsibility, Orientation to Collaboration, Basis of Truth and Rationality, Motivation, Orientation to Work,

Orientation and Focus, and Nature of Time Horizon. The framework from Detert et al (2000) has been used by researchers in IS to examine innovation culture (Khazanchi et al, 2007), organisational security culture (Ruighaver et al, 2007), IS implementations (Wang et al, 2007) and in ES implementations to examine knowledge sharing (Jones et al, 2006).

1.2 Cultural fit

Cultural fit reflects the similarities or differences between an organisation and an IS that will be implemented and implies the amount of cultural change an organisation may need to make to support an IS implementation or how an IS may be adapted to an organisation through customisation (Strong & Volkoff, 2010). We further use the term “cultural distance” to distinguish the wider gap in fit between an organisation and the ES versus the tighter matches that are implied by the term cultural fit. The literature suggests that cultural fit is important in the implementation of new IT to organisations (Cooper 1994; Klein and Sorra, 1996; Dube, 1998; Wagner & Newell, 2004; Strong & Volkoff, 2010). Indeed, researchers have found that particular cultural value orientations may predispose certain groups to favourable or unfavourable adoption of ES (e.g. Klaus et al, 2010). Where fit does not exist the result is likely to be conflict and resistance as workers have to adjust to a new set of values (Strong & Volkoff, 2010) or resist the imposition of new values (Cooper, 1994; Dube, 1998; Wagner & Newell, 2004). Cultural fit was also found to be related to implementation success (Hong & Kim, 2002; Morton & Hu, 2008) suggesting that organisations should avoid ES that do not match their culture. Indeed, Wei et al (2005) found that misalignments could cascade across the project implementation stages which suggests that they are best tackled at the start of implementations. Lastly, Soh et al (2003) found that there may be conflicting forces in play during ES implementations which suggests the importance of cultural dialectics for understanding the phenomenon.

1.3 Cultural dialectics

Prior studies have found that people are mostly unaware of their cultural values until they encounter, and conflict with, a counterculture (Leidner & Kayworth, 2006). Often these instances of cultural conflict are due to tensions developing between opposing cultural values which is known as a cultural dialectic. Within IS research, there is a body of work that has developed a methodology for analysing such tensions. For example, Robey and Azevedo (1994) argued that cultural analysis could be used to identify and understand the organisational consequences of IT. Cultural analysis can provide insight into two major issues

during IT implementation (Robey & Azevedo, 1994). The first regards IT's social consequences which are indeterminate since users can reinvent the material properties of an IT during use, which in turn can explain how the same technology can have different consequences within an organisation (Robey & Azevedo, 1994). The second issue regards IT's role in cultural persistence and transformation within organisations. Cultural persistence is thought to occur through a process of socialisation and institutionalisation where the technology fits in with the status quo within the organisation (Robey & Azevedo, 1994). Cultural transformation, on the other hand, occurs as a result of structural contradictions between the existing values, and the values embedded within the technology, which create the grounds for change within the organisation. This results in an ongoing tension between persistence and change forces highlighting the value of cultural analysis in trying to uncover and understand these forces (Robey & Azevedo, 1994).

Looking at change, Van de Ven and Poole (1995) discussed four theories of organisational change that can provide alternate views of the same phenomenon: life-cycle, teleological, dialectical and evolutionary. Within the dialectical view, stability and change come about because of variations in the balance of power between opposing entities. Change occurs when opposing forces gather enough strength to oppose the status quo or when the status quo is challenged by different entities and their opposing values. The dialectic cycle is therefore one of synthesis or status quo, followed by conflict between the synthesis and new values which challenge that synthesis, and result in change. The outcomes of this struggle provide the starting point for the cycle to be repeated. Dialectic analysis therefore examines the contradictions between multiple entities and opposing values. These entities can include organisations, technology, social groups or anything which contains social values. Contradictions, on the other hand, represent the struggle between these opposing values. For instance, Bjerknes (1991) states that contradictions consist of two opposites where there is an identity and struggle between each. There are two ways to find such contradictions (Bjerknes, 1991). The first is to examine conflicts within a case study to uncover the contradictions that can exist. The second is to use the literature to identify the contradictions and then discuss these in relation to the case (Bjerknes, 1991).

Robey and Boudreau (1999) also examined dialectics and suggested these provided a *logic of opposition* to findings that focused on IT as the sole determinant of change. A *logic of opposition* explains organisational change as opposing forces that promote or impede social

change. They suggested several guidelines for incorporating a *logic of opposition* into research. Firstly, they suggest the identification of opposing forces at play during the organisational change process which may be present in different interest groups within the study. Secondly, they suggest the incorporation of opposing hypotheses into the design of the research to counter the problems of directionality within such studies. Thirdly, they suggest the use of a process-oriented approach to research which can identify the operation of opposing forces over time. Lastly, they suggest the use of multiple interpretations to avoid privileging a single, dominant explanation.

In summary, dialectics provide a useful method for analysing cultural values within case studies because they can account for the different forces that can bring about change between different entities. A dialectical approach is therefore used in this study to examine the interactions between organisation culture and ES implementation.

1.2 Research Question

So, from the above discussion, the main research question for this study is:

1. How does organisational culture affect ES implementation?

This research question seeks to examine the relationship between organisational culture (OC) and ES implementation. In terms of culture, this research will assess and measure OC using the organisational culture framework from Detert et al (2000). This approach can be used to uncover the relationship between OC and the ES in terms of cultural fit, the likely impact in different implementation project stages and the overall impact on the implementation as a whole. For instance, Kayas et al (2008) used case study research to show how OC affected ERP configuration and how the ERP was eventually used. However although research has begun to show how OC can influence ES implementations (Light, 2005; Kayas et al, 2008) insights are limited with calls for further research (Leidner & Kayworth, 2006). This topic is also particularly important as the ES market is predicted to reach \$120 billion in 2012 (Gartner, 2012) and businesses are losing billions annually on failed implementations or implementations that have not delivered expected benefits (Zhang et al, 2005).

This research also seeks to examine the interaction of cultural values between the ES and the organisation which may differ, creating conflict. For example, ES have values that often

reflect the developer's assumptions about business rules, norms and values which are built into the ES (Orlikowski, 1992). However, the values embedded in the ES can conflict with those of the organisation thus shaping and reshaping the organisation in different ways (Soh et al, 2003). This can result in conflict or resistance (Cooper, 1994; Dube, 1998; Wagner & Newell, 2004), or loss of system benefits where conformity to ES values is resisted which can provide the basis for organisational change (Light & Wagner, 2006; Ju & Wang, 2010). This research not only seeks to examine this change process, and identify what cultural values are salient in the ES implementation, but also to understand the dynamics of their interaction across different aspects of ES implementations and different ES contexts using dialectic analysis.

1.3 Justification

The research question and proposed topic of research are important and should be given attention. Firstly, the role of culture in ES implementations has generally been ignored. This is despite the powerful, yet subtle, influence that culture can have in organisations such that IT is often intertwined with culture (Leidner & Kayworth, 2006). Researchers have found that cultural research is still at an early stage despite the importance it could have in explaining IT project failure (Shore, 2005; Leidner & Kayworth, 2006). Further, the majority of research that has been done has focused on examining culture at the national level (Leidner & Kayworth, 2006) despite the criticisms of this approach (Myers & Tan, 2002; Jacob, 2005; Earley, 2006) when applying these results to organisations. At the same time, while some of the extant literature has shown how national level culture could affect ES implementations, there is a great deal of scope for further research to examine the more direct impact of organisational culture on ES implementation. For instance, national level culture studies have typically examined the application of Western based theories to other cultures and how this can influence the development and use of information systems (Myers & Tan, 2002; Leidner & Kayworth, 2006). Straub et al (2002) found that although different cultural levels were important in understanding the influence of culture, national culture was of lesser importance in comparison to organisational culture. Organisational culture studies are also better placed to explain the "contradictory consequences of information technology within a firm" (Leidner & Kayworth, 2006, p358). Thus, a focus on organisational culture may explain more of the cultural impact that may occur during ES implementations than national culture alone.

Most research has examined national level culture and much fewer studies have examined OC and ES implementations (Leidner & Kayworth, 2006). For example, Light (2005) argues that ERP customisations occur to satisfy different social groups in the firm such that group-level culture influences the implementation. On the other hand, Kayas et al (2008) found that OC influences the configuration and subsequent use of an ERP. These studies illustrate how OC could influence ES implementations, although more work needs to be done. For instance, Light's work only hints at the effect of OC on ES implementation as they did not find compelling evidence in support of their argument, while Kayas et al (2008) focused on examining the dynamics of control, thus providing a limited view of the impact of OC on ES implementation. Further, these studies did not use multiple cultural dimensions to disaggregate the concept of OC, nor are we aware of any to date which identify how cultural dimensions could affect ES implementations. If key OC dimensions can be identified then this could provide valuable knowledge to practitioners, which could be used to plan and execute implementations better.

This research can also be justified in relation to gaps in the research around cultural fit, homogeneity and dialectics. Researchers have found that cultural fit is important to ES implementation success (e.g. Wang et al, 2006). Thus, it is important to understand cultural fit because such fit can help increase the likelihood of implementation success (Strong & Volkoff, 2010). Cultural fit studies have so far examined values linked to MIS (Cooper, 1994), organisational climate (Klein & Sorra, 1996), software development practices (Dube, 1998) and ERP best practices (Wagner & Newell, 2004). However, only two studies have looked more closely at cultural fit in ES. For example, Soh et al (2003) found four forces (integration vs. differentiation, process vs. functional, flexibility vs. restrictiveness and packaged vs. organisation) from an examination of a Singaporean hospital implementing ERP while Strong and Volkoff (2010) found six categories of misfits which included organisational culture from a single case study which was not expanded on. This suggests an opportunity for further study to more explicitly examine what cultural dimensions are important for cultural fit for ES and whether these values are shared across different organisational types.

The existing research has focused on culture as being a stable, homogeneous variable (Leidner & Kayworth, 2006) with little consideration for the presence of subcultures or the possibility of cultural and organisational change during ES implementations. However, the presence of subcultures suggests a variety of different outcomes within a single organisation

including potential conflicts as well as conformity or compatibility of some parts of the organisation with a standardised ES. As such, there have been calls for more research to examine the effect of subcultures and how these cultural dynamics can impact ES implementations (Jackson, 2011). For example, Wagner and Newell (2004) investigated an ERP implementation in a university and found that subcultures conflicted with the best practices implemented with the ERP. Jackson (2011) also examined virtual learning environments (VLE) and found that organisational subcultures integrated with VLE differently. However, these studies did not identify groups based on particular cultural values to see how that affected the implementation. Further, the ES context has also not been examined in depth to identify how different groups within the organisation may react to the integration and standardisation required by ES.

The literature has shown that dialectics are useful for analysing values within case studies because they can account for conflict and change between entities (Cho et al, 2007). Dialectics have also been used in IS to explain conflict with the introduction of electronic content management (ECM) systems (Nordheim & Paivarinta, 2006), organisational resilience (Cho et al, 2007) and collective mindfulness (Carlo et al, 2012). Empirical studies examining culture and ES include Robey et al (2002) who examined dialectic learning processes in ERP implementations and Soh et al (2003) who uncovered four dialectic forces that caused misalignments in the ES implementation. However, there is need for more research to develop further our understanding of the role of dialectics in explaining cultural conflict. There is a gap for research that examines more specific dimensions of OC and helps identify standardised values and determines the dynamics of these values between the organisation and the ES. This can clarify how organisational culture can affect ES implementations.

Thus, there are gaps within the literature that provide an opportunity for further study. To achieve this, this study will apply a standardised organisational culture framework to identify sets of cultural values in organisations and subcultures to determine their impact on ES implementations. This research seeks to address the gaps in the literature by conducting case studies of four organisations using dialectic analysis to try to shed light on the forces at play (e.g., Van de Ven & Poole, 1995; Robey et al, 2002). This is justified because case studies are suitable for areas of research which are relatively less well known (Eisenhardt, 1989; Ghauri, 2004) and allowed organisational culture to be disaggregated from the body of the

implementation for dialectic analysis. Dialectic analysis is used to show cultural changes, or system changes, that may be the result of struggles between different values. This can show how cultural change may result from ES implementations as a result of cultural conflict. The ES context represents an excellent context for such research because the implementation of ES can have broad effects across the organisation as the system impacts the organisation as a whole (Strong & Volkoff, 2010). In this context there is a full engagement of the ES to the organisational culture and to any subcultures that may exist providing an opportunity to examine what happens in such situations. This context further justifies the use of case study research to investigate these situations as not enough is known about the cultural dynamics of ES implementation in organisations and this knowledge can be answered through case studies.

1.4 Contribution

This study aims to make a number of contributions to the extant literature by improving current understanding of how OC can affect ES implementations. Such understanding could be used to help identify strategies that can be used to improve the success of ES implementations because of the role that OC is likely to have on ES success. This section details the expected theoretical and practical contributions of this study.

1.4.1 Theoretical Contributions

This study aims to develop an understanding of cultural fit which is of use to both researchers and practitioners. ES impose their own logic on organisational structures (Davenport, 1998) so it is becoming increasingly important to understand cultural fit. Further, the increasingly widespread use of packaged systems has increased the urgency for researchers to better understand cultural fit as implementations are often difficult and unpredictable (Strong & Volkoff, 2010). Researchers have also found that groups are more likely to adopt a technology when their values match (Klein & Sorra, 1996; Morton & Hu, 2008). This research could extend such understanding by identifying particular cultural value dimensions where there may be tensions due to cultural misfits. This is important because addressing cultural fit should enable more rapid achievement of benefits for the organisation (Strong & Volkoff, 2010). Identifying specific dimensions can also lend itself to operationalisation in the future, providing measurement mechanisms for practitioners and researchers to gauge the impact of OC on ES success. This is useful because of the lack of empirical work in this area and the value of understanding specific dimensions that could be

used to predict fit (Leidner & Kayworth, 2006). Further, value can also be obtained by increasing understanding of the full adoption process and the dynamics of fit. This study can contribute to the literature by examining specific conflicts due to each cultural value in general, observing the similarities and differences between them and determining the effect they have on cultural fit and ultimately on ES success.

This study aims to show how ES implementation can shape and reshape the organisation through cultural change. Indeed, research has shown that prior studies have tended to treat culture as being persistent, uniform and consistent across the organisation (Leidner & Kayworth, 2006). This study provides an alternative view by presenting case studies where OC itself may have changed as a result of dialectic conflict. The extant literature has also focused on the impact of culture on technology but not as much on how culture can be affected by technology too (Boersma & Kingma, 2005a; Kayas et al, 2008). This study also aims to provide valuable evidence in support of such views that can deepen understanding of the dynamics of implementation. The aim is to build on the limited work that has been done in this area which suggests that IT can influence culture (Jarvenpaa & Leidner, 1998; Strong & Volkoff, 2010). This study aims to provide further empirical evidence of such dialectic struggles and identify a set of cultural values that may be central to each struggle. The use of dialectics can further augment a process perspective since dialectics are major influencers of organisational change (Cho et al, 2007). By using a dialectic process this study expects to identify key tensions that can impact on ES implementations and determine what importance the social context has on the changes that could result.

Finally, the outcomes of this study may challenge the dominant view within the literature that assumes culture as being homogeneous and stable across ES implementations (Leidner & Kayworth, 2006; Kappos & Rivard, 2008; Jackson, 2011). In particular, this research expects to provide evidence on the effect of subcultures. For example, Huang et al (2003) investigated organisational subculture inconsistencies and the adoption of component-based software development methods and found that clashing values among these hindered the implementation. Von Meir (1999) examined work-group subcultures and found that different occupational subcultures had entirely different cultural interpretations of the proposed technology. Both of these studies show the contradictory consequences of IT implementations due to potentially competing sets of values as a result of subcultures within the organisation (Robey & Azevedo, 1994; Robey & Boudreau, 1999). The identification of particular cultural dimensions which impact on ES implementations could inform the extant

literature and be used to identify different subcultures and the likely effects they could have. This would be expected to contribute to current understanding of the role of subcultures within implementations and the dynamics of such conflict. This could also provide further evidence of cultural homogeneity and provide a note of caution for research that assumes homogenous cultural values in the organisational contexts they are studying.

1.4.2 Practical Contributions

From a practical perspective there is also a need for understanding how OC influences ES implementations (Esteves et al, 2003). Findings from this study can be used to help future ES implementations by informing the selection of ES systems and guiding the implementation project itself. For instance, if specific OC dimensions are found to affect ES implementations then these dimensions can be used to help assess the 'cultural fit' of the ES to an implementing organisation. This could add a cultural element to the ES selection process which has largely been a technical affair. This may also provide more information to steering committees in their evaluation of different systems and influence how they decide what customisations and configuration will be needed. Culture can be problematic in IS implementations (Krumbholz & Maiden, 2001; Walsham, 2002) so the more information steering committees have, the more informed their decisions can be.

This research could also assist practitioners involved with the implementation project itself. The findings from this study could help project teams better plan the implementation as they have more understanding about the impact OC will have. For instance, Kumar et al (2003) found that firms faced more behavioural and management related challenges than simply technical ones. This would mean that project teams could conduct a cultural analysis, to better understand the cultural values of the firm, and use this to better plan the implementation. For instance, in organisations with a strong hierarchical culture, project leaders may need to understand the importance of empowering their project teams, by giving them more input into decision making, if an autonomous decision-making culture is found to lead to better results. This is consistent with work by Ke and Wei (2005) who have theoretically argued that top managers' meta-actions can foster an OC which is conducive to an ES implementation. Thus, findings from this study could contribute to better outcomes for ES implementations.

This study may also provide findings that could be useful to ES vendors and their consultants by helping them to gain a better understanding of how OC may influence ES implementations. For example, Ford et al (2003) argue that many organisations implement IS across national borders which introduce cultural diversity as a key variable. Myers and Tan (2002) also argue that top managers need to be able to relate to those possessing different cultural values from themselves. This understanding of OC can be gained by an increased awareness of their own cultural values and those of others. Thus, as technologies and organisations develop, the need for theory to integrate IS and culture is becoming more important. Findings from this study may help in creating best practices for ES implementations that account for cultural values. Such knowledge could then be used by ES consultants to better understand their clients and how they go about implementing an ES.

1.5 Chapter Outline

Finally, the chapter outline for this thesis is as follows:

Chapter 1 – This chapter provides an introduction to this research and a brief overview of the research. This chapter also includes the research question, the research justification and the theoretical and practical contributions of this work.

Chapter 2 – This chapter provides a literature review on the topics of organisational culture and ES implementations. This chapter presents the findings from the extant literature which has identified relevant findings and the gaps which this thesis explores.

Chapter 3 – This chapter describes the methodology for this study which addresses the research question.

Chapter 4 – This chapter provides an extensive presentation of the results of the case studies that were conducted.

Chapter 5 – This chapter provides an in-depth discussion of the findings of the study and develops a model to summarise and explain the case data.

Chapter 6 – This chapter draws conclusions and acknowledges the limitations for this study. Implications for researchers and practitioners are also presented.

Bibliography – This section provides full reference details for all academic work cited in this thesis.

Appendix – This contains other material that have been referred to in the main text of this thesis or which provides additional background to this thesis. This includes the letters used to gain permission for the case studies and the interview guide amongst other things.

Chapter 2 Literature Review

Enterprise systems (ES) are considered important business software for organisations as they enable the integration of business processes and sharing of resources across an organisation (Markus and Tanis 1999). ES can be defined as commercial software packages that enable the integration of business processes and transaction-oriented data throughout the organisation (Markus et al, 2000). ES can include such organisation-wide software as enterprise resource planning software (ERP), customer relationship management software (CRM), product configuration and sales force automation (Markus & Tanis, 1999). ES are often all inclusive business software that can control the operations of many departments while allowing information to flow around the company. Davenport (1998) describes enterprise systems as systems with a comprehensive database at their core and modular applications supporting the major business activities of the organisation. Such system integration allows information to seamlessly flow throughout the organisation improving efficiency and accuracy.

The integration of disparate information systems into one solution is an attractive benefit of ES. Increasing numbers of organisations are installing ES modules or upgrading to full ES with one estimate suggesting that the ES market will reach \$120 billion in 2012 (Gartner, 2012). However it requires an organisation-wide effort to successfully negotiate its implementation if these benefits are to be realised. Implementation is a major undertaking, which involves key players throughout an organisation, and a number of different factors in order to succeed (Somers & Nelson, 2004). As such, ES implementations often end in failure due to the complex interrelationship between such factors (Akkermans & Van Helden, 2002). The result is that businesses are losing billions of dollars annually in ES implementations that have failed or fallen short on delivering expected reductions in costs and increased profitability (Zhang et al. 2005). Because large ES implementation projects will typically cut across departmental, organisational and even geographic boundaries there is increasing awareness that organisational culture plays a major role in ES success or failure (Krumbholz et al, 2000).

Culture defines the assumptions, values and artefacts of a group of people which influences how they interact with the world (Schein, 1985). Authors have been quick to point out that culture can explain much of the implementation failure that occurs in IS implementations

(Bartis & Mitev, 2008; Kappos & Rivard, 2008; Jackson, 2011). Research on ES and culture has emphasized the importance of cultural fit between the ES and the organisation for ES implementation success (Wei et al, 2005; Wang et al, 2006; Morton & Hu, 2008). However, there is a need for more research to examine the cultural dynamics present in ES implementations including cultural fit and the impact of organisational culture (OC) and subcultures. Cultural fit reflects the extent to which the organisation may need to change its culture to support ES implementation and/or how the ES may be changed to fit the organisation (Strong and Volkoff, 2010). Researchers have found particular value orientations that may encourage or discourage adoption of ES (e.g. Klaus et al, 2010) and tensions that can arise from subcultures with conflicting values (Jackson, 2011).

Dialectic analysis can be used to try and identify and understand the forces at play between the ES and the organisation (e.g., Van de Ven & Poole, 1995; Robey et al, 2002). Large ES implementations in particular, represent an excellent context for examining cultural dynamics, because they can have broad effects across the organisation, impacting the organisation's culture as a whole as opposed to the more localised, individual or group level effects of smaller systems (Strong & Volkoff, 2010). The use of dialectic analysis to examine an ES implementation can also show the cultural changes or system changes that may arise from struggles between different values. This can show how cultural change may result from an ES implementation impacting the many facets of the organisation.

This literature review examines the key literature and concepts related to culture and ES implementations with the aim of providing an understanding of the current state of the field and identifying the key gaps within it. The next section will examine the literature on culture, national culture and organisational culture, to gain an understanding of the meaning of culture. Organisational culture and ES implementations are examined with particular emphasis on cultural fit, cultural homogeneity and the role of subcultures. Cultural dialectics will then be examined which show how values embedded within the ES and the organisation can create conflict in implementations. Following this is a discussion of social shaping, which explains how there can be a mutual shaping of the organisation and the technology as opposed to the predominant view of technology shaping the organisation only. User resistance is then examined which discusses the concept within the IS literature and presents findings. Lastly, implementation process models are examined; the discussion looks

at three key process stages and how culture can influence each stage of an ES implementation.

2.1 Culture

Culture is an important influence in ES implementations which has still not been fully explored in the extant research. For instance, research by Xue et al (2005) and Wang et al (2006) both highlight the cultural differences that can cause problems for ES implementations. This section seeks to examine the concept of culture and various cultural frameworks which can then be used to examine how culture can influence ES implementations.

Schein (1985) developed a very well cited model of culture which conceptualises culture as a construct made up of three layers which are basic assumptions/beliefs, values and artefacts. In Schein's model, beliefs are deemed to be held at the deepest level within individuals and are the least observable of the three levels. These represent the basic assumptions that individuals use to understand the world and form the basis for their behaviour. Values make up the next level of the model and are much more observable than beliefs are. Values reflect an individual's deeper held beliefs and assumptions so that an examination of these more observable values can provide insights into what the deeper held beliefs can be. The third level of Schein's model comprises symbols and artefacts which are the most visible manifestations of culture. However, although they are the most visible of the layers, they can also be the most difficult to decipher in terms of their underlying meaning. Thus, in examining culture, Schein argues that values are the easiest to study as they are more decipherable than artefacts and more observable than beliefs. Thus it is not surprising to find that much literature has focused on cultural values as a basis for examining differences between groups (Leidner & Kayworth, 2006). In particular this is because there is a tight linkage between cultural values and the subsequent behaviours and actions of social groups. Thus, cultural values can be useful in analysing group behaviours and actions.

Culture as a phenomenon can be investigated at different levels. For instance, in information systems, Leidner and Kayworth (2006) note that there has been a division of literature into national and organisational streams. Organisational culture is the focus of this research but this is influenced by national culture. So, both of these concepts are examined in the next section.

2.1.1 National Culture

National culture, or cross-cultural studies have typically examined the application of Western based theories to other cultures and how national culture can influence the development and use of information systems (Myers & Tan, 2002; Leidner & Kayworth, 2006). On the other hand, organisational culture studies have typically examined how the culture within a firm can explain the “contradictory consequences of information technology within a firm” (Leidner & Kayworth, 2006, p358). Despite this division, both streams share a focus on the identification and definition of cultural values that can be used to differentiate cultural groups and sub-groups. For instance, studies by Hofstede (2001), Trompenaars (1996) and Hall and Hall (1990) have focused on a select group of values at the national level. Organisational level studies have identified other cultural values which are important for explaining behaviour (Leidner & Kayworth, 2006). Thus, the predominant approach to examining culture has been to conceptualise it in terms of cultural values, irrespective of the cultural level being examined (Leidner & Kayworth, 2006). In recognition of this, this study also uses a values based approach which will draw on the rich foundation of existing theory in order to identify what cultural values might influence ES implementations. Some of the most important existing theory in national culture and organisational culture literature will be examined next.

Hofstede’s work is the most widely cited national culture work in IS. Myers and Tan (2002) found that two thirds of IS studies used some, or all, of Hofstede’s cultural dimensions. Hofstede (1993, 2001) proposed a model composed of five cultural dimensions that could explain how culture could differ across different countries. The five dimensions of Hofstede’s model are power distance, uncertainty avoidance, individualism-collectivism, masculinity-femininity and long term orientation; later versions of Hofstede (2010) added a sixth dimension (indulgence-restraint) but this has not been used much in the IS literature. However, although Hofstede’s work has been the dominant framework used in cultural studies in IS research, there has been much recent debate about the suitability of these types of national level dimensions. Myers and Tan (2002) argue that national culture is too simplistic because there is no necessary alignment between the culture and the nation state. They argue that culture is a ‘moving target’ which calls for a dynamic view of culture that is contested, temporal and emergent. Likewise, Jacob (2005) contends that ‘grand theories’ such as those from Hofstede and Trompenaars have also outlived their usefulness. She suggests that emerging concepts such as cross-vergence and multiculturalism are better

emerging concepts for researchers to use. Similarly, Earley (2006) also found problems with national level dimension studies, because of the presence of sub-cultures and problems associated with determining the appropriate level of analysis. Thus, the use of cultural dimensions at the national level is problematic when compared to the use of organisational culture which is examined next.

2.1.2 Organisational Culture

The organisational culture literature has also considered a wide range of cultural values which have been used to differentiate organisational cultures (Leidner & Kayworth, 2006). For instance, Leidner and Kayworth found a number of different organisational culture values which ranged from solidarity and mission, to passivity and pragmatism. However, the number of organisational cultural values has been seen as a weakness with too many of them providing little clarity. Detert et al (2000) argued that if an effort was not made to synthesise existing research then interest in organisational culture as a driver for firm performance could fade. This demand has yielded two important frameworks of organisational culture; the competing values framework (CVF) and organisational culture dimensions from Detert et al (2000).

The CVF is an important framework which can be used to assess organisational culture. Quinn and Rohrbaugh (1983) developed the CVF from findings from investigating researcher's perceptions about organisational effectiveness. At the time, organisational effectiveness lacked a strong definition which created problems of measurement. Their research found three different dimensions which were flexibility-control, external-internal and means-ends which can provide understanding of different organisational values. This provides competing values which recognises the tension that can exist in organisations between each of these value points. The CVF has been mostly used as a quantitative model that has been well reported in the literature and which has fairly short, validated measurement instruments for organisational culture (Livari & Huisman, 2007). Indeed, Livari and Huisman (2007) used the CVF in their quantitative study of software development methodologies. There are also few quantitative alternatives to the CVF with notable exceptions of the organisational culture inventory (Cooke and Rousseau, 1988) and Hofstede's cultural inventory. Thus, the CVF has been useful as a quantitative measure of organisational culture for researchers.

An alternative to the CVF is work by Detert et al (2000) who integrated much of the cultural literature to identify eight cultural dimensions. As part of this work, Detert et al (2000) referenced the earlier work of Quinn and Rohrbaugh (1983) in their identification of these eight dimensions. The authors also further justify the development of such dimensions by arguing that frameworks such as the CVF are constrained in the cultural analysis they can perform by the limited cultural values within the framework. The work by Detert et al (2000) is particularly useful because of the potential for a more broad-ranging cultural analysis based on these eight dimensions. To determine the most important organisational culture dimensions, Detert et al (2000) conceptualised culture as a system of shared values which defined what was important to groups of people. Then, to perform the synthesis they conducted a qualitative content analysis of the extant literature. This analysis yielded 13 cultural dimensions which were narrowed down to 8 dimensions after further review. The authors argue that these dimensions could then be used to identify behaviours linked to cultural values which can influence different activities, such as ES implementations. For instance, Detert et al (2000) used this framework to examine the cultural values in total quality management (TQM).

The organisational culture framework by Detert et al (2000) is largely based in the field of management but it has been widely used by researchers to investigate such topics as innovation diffusion (Love & Cebon, 2008), educational quality management (Detert et al, 2003) and the management of state-owned enterprises (Ralston et al, 2006). Further, this framework has been used in information systems to examine innovation culture (Khazanchi et al, 2007), organisational security culture (Ruighaver et al, 2007), IS implementations (Wang et al, 2007) and in ERP implementations to examine knowledge sharing (Jones et al, 2006; Palanisamy, 2007). Thus, this is a useful framework because it can provide the basis for broad cultural analysis, while allowing comparison with existing cultural research.

Jones et al (2006) also used the cultural dimensions from Detert et al (2000) in an IS study which examined knowledge sharing in an ES implementation. The authors used these dimensions to identify cultural values that influenced ES implementation in order to examine how this affected knowledge sharing. The eight dimensions, used by Jones et al (2006), were from Detert et al's (2000) framework and their definitions are shown in Table 2.1.

Table 2.1 The Eight Organisational Culture Dimensions from Detert et al (2000)

Dimension	Definition
1. Orientation to change (stability vs. change)	Extent to which organisations have a propensity to maintain a stable level of performance that is 'good enough' or a propensity to seek to always do better through innovation and change.
2. Control, coordination and responsibility (concentrated vs. autonomous decision making)	Extent to which organisations have decision making structures centred around a few vs. decision making structures centred around dissemination of decision making responsibilities throughout the organisation.
3. Orientation to collaboration (isolation vs. collaboration)	Extent to which organisations encourage collaboration among individuals and across tasks or encourage individual efforts over team-based efforts.
4. Basis of truth and rationality (hard data vs. personal experience)	Extent to which organisations seek truth through systemic, scientific study using hard data or through personal experience and intuition.
5. Motivation (external vs. internal)	Extent to which organisations deem that individuals are motivated by an internal desire to perform well or by external rewards and encouragement.
6. Orientation to work (process vs. results)	Extent to which individuals in organisations focus on work as an end (results) or to which they focus on the process by which work is done as a means to achieve other ends.
7. Orientation and focus (internal vs. external)	Extent to which organisational improvements are driven by a focus on internal process improvements or by external stakeholder desires.
8. Nature of time horizon (short term vs. long term)	Extent to which organisations focus on the long-term of the short-term.

(Jones et al, 2006)

To examine knowledge sharing in ES implementations, Jones et al (2006) collected data from four firms in the petroleum industry which had implemented ERP. From this they found that 'Orientation to Change' and the 'Basis of Truth and Rationality' were the two dimensions unique to the two firms that demonstrated the most knowledge sharing. The findings by

Jones et al (2006) demonstrate the usefulness of the Detert et al (2000) framework in IS. In particular, this work shows how the organisational culture framework from Detert et al (2000) could be useful for investigating culture and ES implementations.

Summary

This literature review has examined key studies in national and organisational level culture research. In developing a research agenda for IS and culture, Myers and Tan (2002) argue that culture is complex, and multidimensional, and should be studied at many different levels. Further, they argue that these levels are often interconnected and intertwined. Straub et al (2002) agree that it is important that the influence of different cultural levels is considered. Straub et al use social identity theory (SIT) to argue that an individual's cultural orientation is formed through their membership in different groups. A person's cultural orientation can thus be influenced by an array of group, organisational and national values. Thus, it is important that a multi-level concept of culture is used to account for the influence of culture at different levels (Leidner & Kayworth, 2006).

This section has discussed the concept of culture. Schein (1985) argues that culture is comprised of three levels of which values are the most easily observed and analysed. Values are also thought to be very influential in shaping individual's behaviour (Schein, 1985). To some extent the observability, and importance, of values explains the popularity in these being used in both national and organisational level research (Leidner & Kayworth, 2006). Hofstede's (2001) cultural dimensions model has been heavily used in IS (Myers & Tan, 2002) and is representative of the type of theory used in national level studies. However, national level studies have been heavily criticised due to misalignments between culture and the nation state, subcultures, and how culture can change over time (Myers & Tan, 2002; Jacob, 2005; Earley, 2006). Researchers examining organisational culture have also identified a number of cultural values which Detert et al (2000) synthesised, to create a framework of organisational culture. As such, we have identified the Detert et al (2000) framework as a suitable option for investigating how organisational culture can affect ES implementation. This framework will form the cultural basis for this study as it can be used to examine the cultural values of the organisation and how these affect ES implementation. Next, organisational culture and ES implementation is examined.

2.2 Organisational culture and ES implementation

ES are one class of packaged software applications and tend to be large, integrated, process-oriented packages designed to meet the needs of the organisation including accounting and control, manufacturing and distribution, sales and order entry, human resources, and management reporting (Klaus et al, 2010). These software packages are of particular interest to ES researchers because they can have broad organisational effects rather than the localized individual and group task-level effects of many smaller packages. Further, because large ES implementation projects typically cut across departmental, organisational and even geographic boundaries there is increasing awareness that organisational culture plays a major role in ES success or failure (Krumbholz et al, 2000). While Jackson (2011) argues that many IT adoption initiatives fail due to a mismatch between culture and the IS being introduced. Culture is becoming an increasingly important factor of interest given the adoption of groupware applications, ES and other internet based systems. Thus, ES implementations are an excellent context for examining the impact of organisational cultures as ES impact on so many different areas of the organisation.

Organisational culture is likely to be a better context for examining such effects as opposed to national culture which has been predominantly used in existing studies (Leidner & Kayworth, 2006). Krumbholz et al (2000) developed a hybrid approach which mixed both organisational and national level work. They developed a model to predict the impact of culture which seeks to describe the elements of organisational and national level cultures that impact on ERP implementations. This model can improve cultural analysis as the model more fully considers the impact of organisational culture in ERP implementations. Krumbholz and Maiden (2001) then report a study that sought to examine this model through a case study of a large European multinational company. The authors found that there was evidence that organisational culture was associated with ERP implementation problems but no direct evidence that national culture caused problems. This showed that organisational culture was more predictive of ERP implementation problems than national level culture was. Organisational culture also allows more fine-grained cultural analysis to occur to try to understand what is happening at the firm level (Robey & Azevedo, 1994).

Researchers have suggested that organisational culture is a somewhat neglected area of IS research and practice (Bartis & Mitev, 2008) despite organisational culture being useful in explaining the behaviour of groups with respect to their interactions with IT in organisational

contexts (Leidner & Kayworth, 2006). Ifinedo (2007) found that organisational culture was linked to ERP implementation success through a quantitative study in Finland and Estonia. Krumbholz et al (2000) also conducted a case study that found that organisational culture clashed with the implemented ERP which created more administrative work and inflexible processes for the company. Research on ES and culture has emphasized the importance of cultural fit between the ES and the organisation for ES implementation success (Wang et al, 2006). It is important to try and understand such fit because that is likely to explain the likelihood of implementation success (Strong & Volkoff, 2010). More work is needed to address such gaps and understand what cultural values may be important and how do these values interact across an implementation. The cultural dynamics present in implementations may go some way to understanding what causes conflict and resistance and how these are resolved.

In order to examine culture clash further it is necessary to examine theories which posit that values can exist in both organisations and the ES they implement. Several authors have concentrated on the use of theories of organisational culture as a means of explaining the contradictory consequences of IT within firms (Robey & Azevedo, 1994; Robey & Boudreau, 1999). An important feature of these studies has been the recognition that IT is symbolic and subject to the various cultural interpretations of those using it (Feldman & March, 1981; Robey & Markus, 1984; Scholz, 1990). This is grounded in structuration theory which theorises the link between social structures and human actions. Giddens (1984) proposes that social reality is constituted by both the subjective actions of humans and properties of institutions. This duality of structure concept sees the structure of social systems as being created by human actions which can then shape future human action. In this way, humans influence structures which in turn influence human action. There is then a continuous tension between human action and the structures that both constrain and are shaped by their actions.

Orlikowski (1992) drew on Giddens (1984) theory and linked it to information technology by arguing that there was the same duality between IT and social structures. IT then has a constituted nature as it is the product of social interaction within an organisational environment. Thus, for an ES, this is the product of human action which reflects the developer's assumptions about business rules, norms and values which are built into the ES. These values have the potential to shape the organisation in various ways (Soh et al, 2003)

as much will depend on implementation decisions that will determine how the system will be used. This view provides an alternative to the idea of technical determinism (Wieck, 1990) which provides insight into how culture can be transformed through technology use. The values within the ES can then provide the grounds for conflict as they clash with the values inherent in the organisation. This can be seen in the cultural fit section, where there can be clashes between values in both the ES and the organisation. These values can also create dialectic conflict which is also examined later.

2.2.1 Cultural fit

The cultural fit literature argues that IS implementations will be affected by the fit between the IS and the organisation. Cultural fit reflects the extent to which the organisation may need to change its culture to support ES implementation and/or how the ES may be changed to fit the organisation (Strong and Volkoff, 2010). Indeed, researchers have found that particular value orientations may predispose certain groups to favourable or unfavourable adoption of ES (e.g. Klaus et al, 2010). Thus, cultural fit is an important topic for further examination which can help us understand how organisational culture can affect ES implementation.

Cooper (1994) argued that organisational culture could inhibit the extent to which IS can bring organisational change. He argues that a realignment of status, power and working habits which accompany new technology may violate groups shared values and meaning and result in culture based resistance. Different organisational cultures require different kinds of information and process information differently which can affect their satisfaction with IS. Where users resist IS based on cultural differences, this can lead to failure, or a reduction, in the desired organisational changes meaning a loss of system benefits. IT can also be adapted to an existing culture which can increase the chances of implementation success but means that organisational change will be limited as a result. To examine these ideas, Cooper developed a survey which theoretically mapped cultural values to an MIS. From this, the author found that different MIS could conflict with organisational culture. This could result in organisational inertia that could impede organisational change through either resistance to the system or changes to the implemented IT which could reduce system benefits.

Klein and Sorra (1996) argued that implementation effectiveness is a function of the strength of the organisation's climate for the innovation and the fit of the innovation to

targeted user values. Where organisational subgroups exist, the innovation may meet some group's values better than other groups which can create conflict. Innovation fit can then either foster or retard innovation use. The authors developed a model from the empirical literature that could predict the impact due to the climate for the innovation and the organisational fit. Where fit was poor, but the innovation was pushed by management, then this could lead to employee opposition and resistance and compliant use of the system at best. Where fit was better, within a strong climate for the innovation, this was met with employee enthusiasm and committed, consistent and innovative use. Thus, the authors concluded that the organisational climate for the innovation was an important factor in the overall success of any IS implementation.

Dube (1998) examined packaged software development and the difficulties and challenges met by organisations that want to change their development methods. The authors noted that software was increasingly developed by vendors and sold as packages to organisations and wanted to understand the issues involved in such practice. A case study was conducted of a developer of travel related software products. The case study found that it was necessary for there to be a fit between the values embedded within the development process and the values that are part of the organisational culture if there is to be a successful outcome. In the case study, a software development process was chosen that conflicted with the existing organisational culture which unsettled the organisation and led to conflict and resistance.

Soh et al (2000) argue that a common problem of adopting packaged information systems is due to misfits that can arise between functionality offered by the package and that required by the company. From a study of ERP implementations in Singapore hospitals they found country and culture specific differences which they categorised into three groups of misfits; data, functional and output. The authors found that misfit resolution involved either workarounds or package customisation. They also found that the ERP favoured Western business models that created misfits when implementing within an Asian context. Early identification and resolution of such misfits enabled better planning for resolution and change management. Soh et al (2003) built on this work and developed the cultural aspects of these misfits that can originate between the ES and the organisation. The authors found that a dialectic approach allowed a deeper examination of these impacts which is discussed in more detail later in this review.

Hong and Kim (2002) argued that cultural fit could explain the high rate of ES implementation failures. The authors further argue that cultural fit predicts implementation success because adaptation and extensive customisation of ES leads to higher rates of failure. As a result, researchers suggest that the organisation should adapt to the ES rather than the ES being customised to fit the organisation. Hong and Kim also constructed a research model to examine organisation-ES fit and how it could lead to implementation success. They then conducted a survey and found that organisation-ES fit was significant and positively related to ES implementation success. An interesting finding was that beyond a certain level of cultural fit, more adaptation of the ES system only led to lower rates of implementation success. This is likely due to the increased cost of customisation and the need to maintain such customisation when upgrades are needed.

Wagner and Newell (2004) argue that the best practices embedded in ERP systems will not be suitable for organisations with 'epistemic cultures' where there are users with varied backgrounds, goals and approaches to practice. They suggest that the 'whole house view' of ERP and its integrated form, forces all users into using a standardised template no matter how decentralised or autonomous they may be. They also argue that organisations are forced into adopting the 'best practices' of the ERP through organisation adaptation which might not fit with how the organisation runs. They conducted a case study of an American university that had adopted an ERP system. The authors found that in contexts where there were diverse user groups, with different work practices and levels of background experience, that a single industry solution is not going to be best for all perspectives. Instead, the developed ERP only met the needs of central administrators rather than those of faculties who actually use the system. Thus, this article shows support for the importance of cultural fit of ES systems, and the impact of subcultures on ES implementations.

Wei et al (2005) argue that the successful implementation of ERP will depend on how misalignments are handled throughout each implementation stage. From the literature, the authors find that the high failure rate of ERP implementations may stem from the need for mutual adaptation between the organisation and ERP system. Resolving such misalignments may require both technology and organisational changes. So, they used a process model (Markus & Tanis, 1999) and conducted a single case study of a Taiwanese electronics firm. From this, they made findings from each of the four implementation stages where a number of technological and organisational changes needed to be made. They found that there was

a cascading effect across the implementation due to misalignment problems from earlier stages. They concluded that managers should not underestimate the importance of change across implementations and they found some evidence that misalignments could be specific to particular implementation stages as well. In other words, there were change drivers at particular stages that were inconsistent and contradictory across implementation stage.

Morton and Hu (2008) argue that an organisation's structure is an important predictor of ERP implementation success as resistance is determined by the fit between structure and the ERP. The authors argue that prior work has shown the importance of cultural fit (Soh et al, 2000; Hong & Kim, 2002) and seek to extend this by identifying what properties of organisational structure were important. Organisational structures that do not fit ERP (i.e. low levels of business integration or non-standardised work processes) will encounter high resistance from the organisation as the ERP pushes the organisation to integrate functions and units and to adopt the standardised business processes of the system. Thus, organisations with good fit towards the ERP are likely to have greater chances of success than those with worse fits. Organisations with poor fits are likely to face organisational resistance and more chance of ERP failure. Further, they argue that the dynamics of structure may also change such outcomes as organisational structures are not fixed.

Strong and Volkoff (2010) identified six misfit domains that represent potential gaps between organisations and ES systems. The authors argued that ES is one class of packaged software which involves customisations to fit the organisation. The authors drew on work by Soh et al (2000) and sought to extend this work by using grounded theory and a longitudinal study of an ES implementation at a maker of industrial equipment in the United States. They found that there were six categories of misfits; functionality, data, usability, role, control and organisational culture. For organisational culture misfits, they defined these as cases where the ES requires ways of operating that contravened organisational norms. For instance, prior to the ES, workers would heroically try to do everything possible to finish work while use of the ES requires the need to follow inscribed rules and processes with regard to finishing work. Employees found this to be a misfit, because they could no longer work 'heroically' and were constrained by the disciplines needed to complete the work using the correct process.

So, this review makes a number of findings. The first, is that it shows the importance of cultural fit to the implementation of new IS in organisations (Cooper 1994; Klein and Sorra, 1996; Dube, 1998; Wagner & Newell, 2004; Strong & Volkoff, 2010). Where there is not cultural fit, the result is likely to be conflict and resistance as workers have to adjust to a new set of values (Strong & Volkoff, 2010) or resist the imposition of new values (Cooper, 1994; Dube, 1998; Wagner & Newell, 2004). Wagner and Newell (2004) found that cultural fit could vary based on subcultures which are explored in more depth next. Cultural fit was also found to be related to implementation success (Hong & Kim, 2002; Morton & Hu, 2008) suggesting that organisations should avoid ES that do not match their culture. Soh et al (2000) provided the basis for much of this research by recognising misfits from Western based ERP systems being implemented in Asian contexts. Follow up to this work suggested the importance of cultural dialectics being used to analyse conflicts due to cultural fit (Soh et al, 2003) which is another topic examined in more depth later. Finally, Wei et al (2005) suggest that misalignments could cascade across project implementation stages which suggest that they are best tackled at the start of an implementation to avoid the additional impacts they will otherwise have.

2.2.2 Cultural homogeneity and subcultures

This section examines cultural homogeneity and the existence of subcultures within organisations. Leidner and Kayworth (2006) found that two thirds of empirical studies examining culture and IT investigated the phenomena from the integration perspective (Meyerson & Martin, 1987), such that culture is viewed as persistent, uniform and consistent across the organisation. Extant studies have treated culture as being homogeneous and do not address the existence or impact, of different cultural values that may exist within an entity (Jackson, 2011). So, the aim of this section is to explore research questioning cultural homogeneity and to examine subcultures which are one of the main counter-points against the idea of cultural homogeneity within organisations.

Kappos and Rivard (2008) argue that there is no consensus around the interpretations upon which culture is viewed. As such, they adopt a conceptualisation which views culture from three perspectives; integration, differentiation and fragmentation (Martin, 2002). *Integration* assumes the actors within a collective interpret manifestations in the same way. *Differentiation* argues that organisations usually do not have a singular, monolithic culture and that organisational subcultures can challenge, modify or replace this culture. Lastly,

fragmentation suggests that there are ambiguous interpretations that cannot be ignored (as in the integrative perspective) or attributed to subcultures (as in the differentiation perspective). The authors used a literature review to analyse and synthesise cultural papers from IS journals. From these findings, they arrived at a model that included three perspectives that reflected the current state of knowledge from the literature. This suggests that a focus on multiple perspectives can yield greater understanding of the role of culture in IS endeavours.

Jackson (2011) argues that organisational culture is an important factor in IS implementation success. But, studies have continued to view culture as being well integrated and shared whilst downplaying the dynamics of culture and how this influences IS adoption over time. Jackson follows a similar path to Kappos and Rivard (2008) by suggesting that Martin's (2002) three perspectives of culture can offer more understanding of the role of organisational culture in IS implementation. To examine their assertions, Jackson conducted a longitudinal case study of a higher educational institution in the United Kingdom. The results showed that the use of the three perspectives was a useful way of understanding the multi-faceted nature of culture. The results showed how culture was not static across the implementation but changed over time. For instance, with the movement from an integrated egalitarian culture to a culture where there was more ambiguity. These cultural shifts were often due to triggers which differed and conflicted with existing values held by individuals. This showed that culture at the organisational and subgroup levels could strongly influence IS adoption and that not all elements could be controlled. Jackson argues that there needs to be further frameworks to understand the dynamic nature of conflict and the impact when values crash and collide. Culture should be perceived as a dynamic process where entities react to one another and to the world around them in a continuous cycle.

So, the prior studies challenged the assumption that culture was homogenous within organisations and suggest that culture could be studied from different perspectives instead based on Martin's (2002) work.

The following studies also show support for this subcultural view within organisations. First, subcultures are reviewed from the management perspective, where there have been more studies published, before switching back to IS where studies show the impact of subcultures within this field.

From the management literature, Sackmann (1992) examined the existence of subcultures within an organisation and whether they affected knowledge sharing. He found nine different cultural groupings across four kinds of cultural knowledge that showed that organisations with strong cultures could be less homogeneous than they appear. In a theoretical paper, Schein (1996) argued there were three different subcultures within firms; operators, engineers and executives. Often these cultures are not aligned with each other and work at cross-purposes. Hofstede (1998) also found support for three subcultural groups within firms from a study of a large Danish insurance company. These groups were professionals, administrators and customer interface which match quite closely with what Schein (1996) suggested. Parker (2002) showed that groups within firms had different understandings of the history and culture within a banking organisation. This showed the fragmentation that can exist within organisations and that shared understanding is not always homogeneous. Finally, Howard-Grenville (2006) found that subcultural groups shaped how environmental issues were interpreted and acted on. In particular, different subcultures had favoured strategies for action which matched the problems they were used to dealing with.

So, within the management literature there has already been research that has found evidence for subcultures in organisations that can interact differently with other organisational groups and the environment in general. There has also been a variety of work in IS that also argue for, or have found, the presence of subcultures and their effects. Cooper (1994) suggests that cultural resistance can violate groups shared values and meanings leading to resistance to the new IT. Wagner and Newell (2004) found that different groups within a university had different needs so that the best practices of the ERP did not fit with how these groups operated. Ravishankar et al (2011) found evidence that different subcultural groups affected the implementation of a KMS within an organisation. Von Meier (1999) examined work group subcultures and found that two groups had different cultural interpretations of the technology leading to conflict and resistance in their adoption. This is consistent with work by Schein (1996) and Hofstede (1998) supporting the presence of particular subcultures within organisations. Von Meier used a case study of an electric power distribution company to find two occupational subcultures called “operators” and “engineers.” Both groups were motivated in trying to help the IS become successful,

however they both held different values which affected how they viewed the implementation.

Huang et al (2003) investigated the relationship between organisational subcultures and the adoption of software development methods. They used an exploratory case study of a multinational banking corporation which implemented component-based development (CBD). Their theoretical approach was grounded in work by Robey and Boudreau (1999) where they employed a *logic of opposition* and where they found it most useful to adopt a cultural theory lens to analyse their data. They found that the clash of values between subcultures could hinder the information sharing and collaboration to integrate the CBD system. Their analysis emphasized fragmentation and differentiation as a way of understanding how subcultural differences influenced each stage of the CBD implementation. The outcome of these subcultural differences, and the lack of collaboration between these groups, meant that the implementation had not achieved its expected benefits. Management was aware of some of these problems but had not been able to overcome them, particularly in relation to the lack of collaborative culture that was needed.

Bartis and Mitev (2008) examined the social construction of technology (SCOT) and groups within an organisation to determine the cultural fit between technology and subcultures. They argue that there is a growing research stream examining the importance of organisational issues and IS failures and suggest that social shaping issues can cause user resistance, and hence, IS failure. They also note that organisational culture has an important part to play around IS implementation and that this has been largely ignored to date (Gallivan & Srite, 1997). The authors used a cross-sectional case study of an implementing company and its software vendor. They found that different social groups attributed different values to the technological artefact. The authors' use of organisational power and narratives also found that there was a lack of fit between the new system and organisational subcultures that showed why users were dissatisfied and the system under-utilised. More broadly, the social groups showed that attributing success or failure was constructed differently by these groups.

So, this section examined cultural homogeneity and subcultures and finds in favour of the view that subcultures can exist which is a strong argument against the idea of cultural homogeneity in organisations. Kappos and Rivard (2008) and Jackson (2011) both used

Martin's three perspectives of culture and found these were useful for analysing culture within IS. In terms of subcultures, the management literature has focused on identifying particular subcultural groups within organisations (Sackmann, 1992; Schein, 1996; Hofstede, 1998). These could be loosely grouped as management, operators (i.e. engineers or producers) and administrators. Other research also shows that culture is not homogeneous within organisations (Parker, 2002) which could shape how they interact with the environment (Howard-Grenville, 2006). These findings were reflected in the IS literature with Von Meier (1999) finding evidence of particular subcultures (operators and engineers) and Bartis and Mitev (2008) finding that subcultures viewed systems differently which affected satisfaction and use. Indeed, the presence of subcultures complicates the fit of IS to organisations, because different subcultures can react differently to the IS (Cooper, 1994; Ravishankar et al, 2011; Wagner and Newell, 2004) or a lack of cultural fit can hinder the implementation (Huang et al, 2003). Finally, Wagner and Newell (2004) find that subcultures may have different needs which cannot best be met by a standardised ES. So, this section shows that subcultures can be an important factor in ES implementations and an important factor that should be taken account of. Jackson (2011) argues that there needs to be more work examining the dynamic nature of such cultural conflict and this is addressed in the next section on cultural dialectics.

2.2.3 Cultural dialectics

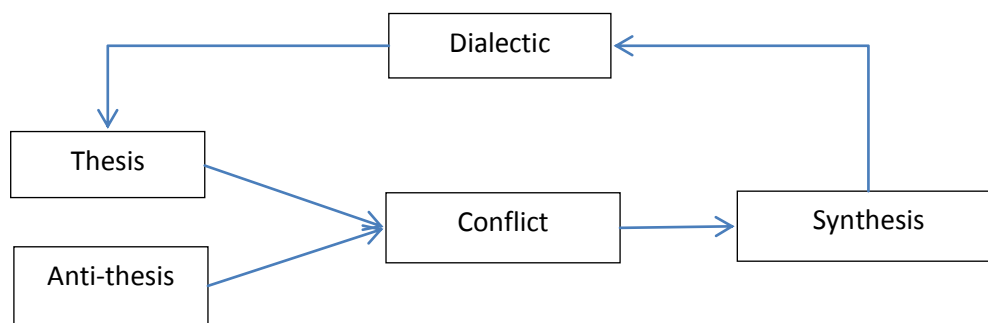
Leidner and Kayworth (2006) found that in much of the cultural literature, culture usually goes unnoticed within a group until there is some form of cultural conflict. They find that people are mostly unaware of their cultural values until they encounter, and conflict with, a counterculture. Often these instances of cultural conflict are due to tensions between opposing cultural values, which is known as a cultural dialectic, and there is a body of past research within IS that has developed a methodology for analysing such tensions.

Robey and Azevedo (1994) argued that cultural analysis could be used to understand the organisational consequences of IT and how IT can preserve or change the organisation. They argue that a focus on organisational culture is a move towards less deterministic explanations of how IT can change organisations with a focus on the organisation's role in change. As such, the use of cultural analysis can provide insight into two major issues during IT implementation. The first is that IT's social consequences are indeterminate because users can reinvent the material properties during use, which can explain how the same technology

can have different consequences within an organisation. A technology can also acquire different meanings within different cultures as well. The second issue is to account for IT's role in cultural persistence and transformation within organisations. Cultural persistence is thought to occur through a process of socialisation and institutionalisation where technology fits in with the status quo within the organisation. Cultural transformation, on the other hand, occurs as a result of structural contradictions between the existing values, and the values embedded within the technology, which create the grounds for change within the organisation. This creates ongoing tension between persistence and change highlighting the value of cultural analysis in trying to understand these forces.

The work by Robey and Azevedo (1994) presents an early conception of dialectics and their role in organisational change. Van de Ven and Poole (1995) added to this literature by bringing theories of organisational change together by suggesting that each of these four theories provided alternate views of the same phenomenon; the four theories being life-cycle, teleological, dialectical and evolutionary. With dialectic theory, they argue that the "organisational entity exists in a pluralistic world of colliding events, forces or contradictory values that compete with each other for domination and control (p517)." Within a dialectic, stability and change are due to the balance of power between opposing entities. Change occurs when opposing forces gather enough strength to oppose the status quo. This is consistent with the work of Robey and Azevedo (1994) in how they view change and stability within organisations. Change occurs when the status quo is challenged by different entities and their opposing values. The dialectic cycle is then one of synthesis, or a status quo, followed by conflict between the synthesis and new values which challenge that synthesis. The outcome of that struggle then provides the starting point for the cycle to repeat. Van de Ven and Poole's (1995) dialectic model is shown in Figure 2.1.

Figure 2.1 Van de Ven and Poole's (1995) Dialectic Model



So, from the preceding discussion, dialectic analysis examines the contradictions between multiple entities and opposing values. These entities can include organisations, technology, social groups or anything which contains social values. Contradictions, on the other hand, represent the struggle between these opposing values. Bjerknes (1991) provides guidelines for researchers in finding contradictions within case studies. Bjerknes states that a contradiction consists of two opposites such that there is identity and struggle between these parts. Bjerknes suggests two ways to find contradictions. The first is to examine conflicts within case studies, as this will show the many contradictions that can exist. For instance, the examination of conflicts within a case can yield the competing values that are present. The second method is to use the literature to identify contradictions that exist and discuss those in relation to the case. Bosserman (1995) also examined dialectics from a sociology perspective and found several processes that can help illuminate the contradictions that might exist. These processes included complementarity, mutual implication, ambiguity, polarisation and reciprocity. Bosserman argued that these processes could be used to analyse an endless array of social groups within society because they represent the dialectical nature of reality and how relationships can change between these groups.

Robey and Boudreau (1999) also examined dialectics and suggested these provided a “logic of opposition” to the inconsistent findings from literature, at the time, that had focused on IT as the sole determinant of change. A logic of opposition explains organisational change as opposing forces that promote or impede social change. As such, the authors suggested several guidelines for researchers looking to incorporate a logic of opposition within organisational culture. Firstly, they suggest the identification of opposing forces at play during the organisational change. Opposing forces may be present in different interest

groups or other entities within the study. Secondly, they suggest the incorporation of opposing hypotheses into the design of the research. The directionality of hypotheses can be difficult in these types of studies which call for multiple, competing, hypotheses. Thirdly, they suggest the use of process research. Process research can show the operation of opposing forces within the events of the organisation over time. Lastly, they suggest the use of multiple interpretations to avoid privileging a single, dominant explanation. Specifically, they cite the use of Martin's (1992) three perspectives of integration, differentiation and fragmentation to aid understanding of organisational culture. Additional insights can be gained from adopting a different perspective 'lens' to the study in question.

The preceding research papers have developed the conception of dialectics as the result of competing forces, or values, between entities which compete for domination and control. This can be between separate organisational entities or between the organisation and a new technology to be implemented (Robey & Azevedo, 1994). Importantly, contradictions represent the struggle between these competing values and different authors have suggested guidelines for how these can be found (Bjerknes, 1991; Bosserman, 1995; Robey & Boudreau, 1999). So far, this discussion has been at the theoretical level, next, four IS research studies are presented that use the dialectic approach to provide an understanding of the use of dialectics in a practical sense.

Robey et al (2002) examined dialectic learning processes in firms that had implemented ERP. With an understanding of dialectics, then all ERP implementations would be expected to manifest both forces promoting change and forces opposing change. Dialectics were then used to examine the tension between established work practices and the requirements for new practices to support the new system. The authors collected data through a comparative case study of 13 firms using structured telephone interviews with three people from nine companies and two people from the remainder. For each case the authors created a matrix which included the dialectic forces they thought were at play. Their results found evidence for a dialectic of learning between the old knowledge and practices of the legacy system and the new processes and practices of the ERP. The older knowledge and practices provided a significant barrier to the learning that was needed to support the new system. Thus, in this case, implementing an ERP system could be understood as a dialectic of learning.

Soh et al (2003) argued that often ERP systems are not fully aligned with the organisation's they are being implemented in and that these misalignments are the result of opposing, dialectic forces that arise from values embedded in both entities. Where ERP systems are not customised to the organisation's structures, then users have to adapt to the processes embedded within the system, or work around them. However this can be an expensive long term solution to the problems caused by these misalignments. So, using dialectics, the authors examined the nature of these misalignments and tried to understand the opposing forces in play. As such, they conducted an intensive case study of a large, Singaporean hospital implementing an ERP package. They then used an iterative process to move from a 'surface' identification of the misalignments to trying to identify the deeper forces within. Misalignments were then categorised, taking into account the context, and arriving upon a description of the underlying dialectic forces at play. They found these opposing forces to be integration/differentiation, process/function, flexibility/restrictiveness and domain/specific. The authors concluded that using a dialectic approach allowed a deeper examination of the impact of the structural forces embedded in the ERP and the organisation and the tensions that resulted between the two entities.

Nordheim and Paivarinta (2006) examined electronic content management (ECM) systems in a large oil company. Drawing on work by Van de Ven and Poole (1995) describing four motors of organisational change, Nordheim and Paivarinta (2006) used a hybrid approach incorporating the motors of dialectics, teleology and evolutionary change to explain what happened during different implementation phases. The paper examined a Norwegian oil company and collected data from key project members and project documentation. They found elements of the lifecycle approach which were evidenced in how the project was organised into stages and guided by management. The first few phases could also be understood in relation to the teleology motor in that actions in these phases were guided by learning and goal clarification. The dialectic of adaptation (Soh et al, 2003) and dialectic of learning (Robey et al, 2002) were observed primarily from the implementation stage onwards. Dialectics were notable in explaining changes and the stages in which they occurred with these being observed from the implementation stage onwards. Finally, the authors did not recommend which approach was best but instead suggested that each motor was useful in explaining the different changes observed in the case study.

Cho et al (2007) examined organisational resilience using dialectics to solve the contradictions due to the adoption of a new Telehealth innovation. The authors used a dialectic analysis to examine the major contradictions at both individual and organisational levels which they argued offered a deeper understanding of resilience. A single case study design was used to collect data from 27 staff from five different hospitals. The data was coded using a series of content coding categories drawn up from their research notes and the literature. An interim set of contradictions were then identified and refined down to three intra-organisational and three inter-organisational contradictions. For each contradiction they noted the level (intra/inter), contradiction, identity, struggle and consequence of each, based on the suggestions and guidelines from the literature (Bjerknes, 1991; Robey and Boudreau, 1999; Robey et al, 2002). They concluded that dialectics can augment a process perspective as they observed a change in the relative importance of the contradictions as the adoption process unfolded. They found that dialectics were useful in exploring the difficult concept of resilience because it could help uncover the contradictions involved within the study and how these shaped the adoption process.

Lastly, Carlo et al (2012) examined collective mindfulness and argued that this comes about due to a dialectic process between mindful and mindless behaviour. To examine this, the authors investigated a complex engineering project by architect Frank Gehry. Using past literature, they identified five processes that explained collective mindfulness but found that they did not take into account the duality that can occur. They then used a qualitative, single case study involving interviews with many staff over the length of the project. They used dialectics to analyse the case and began by seeking contradictory pairs for each of the five processes they had previously identified from the literature. They then re-examined their initial open coding to identify a set of thematic indicators for each pole, which included testing for rival explanations, searching for contradictory evidence and continuously refining their themes and categories. From this, they identified a set of incidents for each element of collective minding and applied the dialectic method to identify the contradictions (Bjerknes, 1991). For each contradiction they then examined the complementary, mutually implicating and polarizing relationship between each pair. From this analysis, they could show how the technology was appropriated for each incident and in which pole the contradiction was evoked. This showed the contradictory ways in which actors engaged with the five elements of collective minding and led to their conclusion that being mindful only emerged from a continuous struggle between the contradictions of organising.

So in summary, dialectics provide a useful method for analysing cultural values within case studies because they can account for the different forces that can create change between different entities. As such, there has been a small, but regular, use of dialectic analysis within the IS literature. All of the research presented used case study methodology while their analysis of the dialectics ranged from more simple analysis (Robey et al 2002; Soh et al, 2003), using an iterative process to uncover contradictions, to the later studies using more 'full blown' analysis based on guidelines from the literature (Bjerknes, 1991; Robey and Boudreau, 1999; Robey et al, 2002). Regardless, of each paper's methodology, the result for each study has been additional insight and understanding of the forces at play within each study.

2.3 Social shaping of technology

The social shaping of technology (SST) theory is research which examines social, institutional, economic and cultural factors that have shaped the direction and rate of innovations, the different forms of technology and the outcomes of technological change for different groups in society (Williams & Edge, 1996). This section of the literature review examines this body of research to determine how culture can shape ES implementations or how there can be a mutual shaping of technology and organisation as part of an implementation.

Williams and Edge (1996) published a well-regarded review of the existing SST literature to show the usefulness of the approach and how SST can offer a deeper understanding of technology implementation. SST studies show that technology is not deterministic but is instead a social product which is patterned by the conditions of its use. At every stage of a technology implementation there are social factors that influence the different choices that are made. These choices stress the negotiability of the technology such that it can be shaped to the needs of particular groups to meet their own needs at the expense of others. This affects the content of the technology and the implications of the technology to the organisation. Williams and Edge also suggest that technology and organisation cannot be treated as separate entities rather it is social settings that shape technology and technology that shapes social settings. Thus, there is a mutual shaping of both entities which should be considered together to understand more fully what happens during an implementation project.

Boersma and Kingma (2005a) applied SST theory to ES implementations. The authors argue that an ERP can conflict with the existing culture which can mean extensive change management is needed. This is because ERP changes how people work, their principles and their beliefs so implementers should be ready for the resistance and the pain this can bring. They suggest three perspectives of ERP systems. The first is the constitution of the system, i.e. everything that went into the creation of the system. The next is that ERP is a condition of organisations such that the organisation has to change to accommodate it. Lastly, is that there are unintended consequences of ERP such as shifts in power and standardisation that must also be accounted for. The authors suggest that SST theory encompasses all three of these perspectives which can be used to discuss the social impacts of change rather than change being driven by technology alone. Thus, organisational cultures will be important for understanding their impact on ERP as the authors found many implementers had suggested this was a source of many problems on implementations.

SST theory has also been used as a theoretical base for a variety of empirical studies that draw directly from the theory or which have made findings that show how the organisation can affect ES implementation. Boersma and Kingma (2005b) argued that the interaction between an organisation's culture and the implementation of ERP is a process of sense making which can be understood with the application of SST theory and theories of organisational culture. This paper builds on their earlier paper which argues that SST theory can be used to investigate how organisations are transformed by the development of ERP. They examined these ideas through a case study of an American vehicle manufacturing company which informed their ideas about the mutual shaping of technology and organisational culture. They argue that their findings showed that both the ERP and the organisation were transformed by the implementation.

Light and Wagner (2006) challenged the view that ERP's should only be configured with customisation avoided wherever possible. Instead, they presented two studies which show how organisation needs often forced the need for customisation to occur. For instance, organisations often have difficulty attaining integration with the ERP through software configuration alone and suggest that customisation is an important and valid process in such situations. The authors draw from SST theory and argue that complex technologies are not acquired as integrated systems but are assembled to suit particular contexts through innofusion (i.e. here innovation occurs at the local level). With two exploratory case studies,

the authors identified a number of important customisations which were necessary to match the businesses' existing processes and socio-technical practices. The authors found that integration can be achieved when existing socio-technical practices were taken into account of system design and the customisations that were conducted in each case were important factors in the success of each system. The paper shows that a more nuanced view of customisation is needed because some ERP implementations are likely to need a balance of customisation and shaping of organisational practices to succeed.

Kayas et al (2008) discuss the influence of organisational culture and ERP in developing a panoptic gaze which involves the potential to exert disciplinary power in relation to monitoring and surveillance. They found that research had perceived ERP as determining the social context rather than something which can also be shaped by the social context. The authors conducted a case study of an education institute's finance division. They found that management used the ERP to overtly monitor employee's work and raise problems or issues with them at the time they were noticed. The organisation did not have a culture of workforce surveillance and this was carried over once the implementation was completed. These cultural values then influenced how the system was used as management did not use the system for covert surveillance to monitor workforce performance. Thus, this study showed how the organisational culture of the company influenced how the ERP system was used after implementation.

Jenson et al (2009) explored institutional and sense-making theory to examine ERP systems implementation. Institutional theory is used to examine how institutions are changed, maintained and reinforced during IS implementation. They used a qualitative case study of an ERP system used by a group of doctors in a Danish hospital. They found that although doctors were in agreement about the benefits of the system, they were not happy about the increase in administrative tasks they were now expected to do to increase efficiency. Doctors refused to accept these new practices and instituted workarounds that were a solution to these perceived misalignments between the institution's practice and the ERP. Thus, doctors shaped system practices to meet their existing modes and beliefs of practice; particularly their aversion to time spent on administration tasks at the expense of patient care. So, while this paper does not show the influence of culture on customisation of the ERP, it does show how culture can affect how the system is used, and the benefits that can be realised from it.

Lastly, Ju and Wang (2010) examined ERP closure within a large organisation that had implemented ERP. ERP closures were defined by the authors as the “end of controversies among various social groups and the stabilization of ERP technology” (Ju & Wang, 2010, p1). In particular, this study investigated the dialectical interplay between the ERP and the organisation using SST theory. To examine this, they collected 18 interviews from staff at a large multinational that had implemented ERP. They found that ERP closure can be provisional with cycles of stabilisation and destabilisation which is consistent with a lot of the dialectics literature around syntheses (Robey et al, 2002; Soh et al, 2003; Cho et al, 2007). They also found that it was necessary to study both the organisational actor’s interplay but also the contextual influence to understand what was going on. Lastly, they found that customisations were important to align diverse social interests and create integration with the system. However, as users became increasingly reliant on the system they began to search for the best practices of the SAP which had been customised out of the system. Thus, the authors suggest that a polarised approach is not ideal and that some balance between vanilla ERP implementations and customisation should be reached.

The above discussion of social shaping theory (SST) suggests that there can be a mutual shaping of both technology and the organisation during ES implementations (Williams & Edge, 1996). However, as this is a negotiated process there is a danger if only one group is involved in the decision making about the project when the implementation can affect several groups (Williams & Edge, 1996; Wagner & Newell, 2004). Boersma and Kingma conducted two studies (2005a, 2005b) which showed how SST theory could be applied to ES implementation and organisational culture. Authors of other empirical work have found a variety of interesting findings to inform this thesis. For example, Light and Wagner (2006) and Ju and Wang (2010) suggest that there needs to be a balance between customisation and configuration as both strategies may be needed for integration to be achieved. Kayas et al (2008) and Jenson et al (2009) also showed how the organisational culture can shape system use after Go Live. In both of these studies, organisational culture influenced how the new system was used, which was consistent with prior values. Thus, these studies provide some insight into how organisational culture can shape ES implementation.

2.4 User resistance

User resistance is also an important topic for investigation because it can detail the conditions upon which user's resist ES implementation which may involve other factors outside of culture alone. So, in this section we examine several papers on user resistance within the IS literature and seek to uncover findings that can be applied to this study.

Markus (1983) published a well-regarded review of user resistance that drew on theories of user resistance discussed in Kling (1980) and evidence drawn from a single IS case study. Kling (1980) suggests there are three key types of user resistance: 1) resistance due to factors internal to the person or group, 2) resistance due to factors inherent in the system and 3) resistance due to the interaction between characteristics of the people and characteristics of the system, which is also known as interaction theory. Interaction theory is of most use to this thesis because the socio-technical variant considers how changed roles and responsibilities of an IS implementation may be at odds with the prevailing organisational culture. This suggests that the greater the implied change between the organisation and the IS, then the more likely there will be organisational resistance. This can explain different outcomes for the same system being implemented in different settings because resistance will be due to the interaction between the system and those different settings. As such, there can be a variety of different outcomes based on the interaction between the system and the organisation.

Jiang et al (2000) also drew on interaction theory to suggest that resistance to change could be based on system characteristics. The authors surveyed 300 non-IT managers to examine whether resistance was due to system, people or some interaction between them both. Their findings suggested that resistance differed based on system type and suggested that practitioners needed to focus more on issues of power, social status and job security when implementing decision support type systems.

Lapointe and Rivard (2005) sought to extend the interaction model by including group and organisational levels in addition to the individual level of the existing model. They suggest that there can be threats to change that can occur at these different levels due to IS implementation. They suggest that there are five characteristics of resistance. 1) Resistance behaviours which can include responses such as apathy, passive resistance, active resistance and aggressive resistance. 2) Objects of resistance such as the implementation of new IT. 3)

Perceived threats in which some threat is recognised that provokes resistance to change. 4) Initial conditions, which include the existing social context such as established routines or distribution of power. 5) Subject of resistance, which is the entity that adopts the resistance behaviours such as the individual or group. These were then examined with data from three case studies of the implementation of electronic medical records (EMRs) in hospitals. The findings from this research suggested a resistance model where initial conditions interact with the system, and if there are perceived threats, then this can lead to resistance behaviours which can cause the cycle to repeat again.

Kwahk and Lee (2008) investigated how readiness may better prepare users for ERP implementation change. The authors focused on *readiness for change* which they defined as positive views of members towards the needs for change, *organisational commitment* which was the strength of an individual's feelings towards their organisation and *personal competence* which revolved around their feelings about how well they did their job. The authors examined these concepts with a survey to 350 individuals who had been involved in ERP implementations in Korea and received 312 replies. From their results, they developed a structural model and found that readiness for change indirectly influenced the behavioural intention to use ERP which was directly affected by organisational commitment and perceived personal competence. However, being a study situated in Korea, these results may not be generalisable outside that context, particularly as culture was not taken into account.

Kim and Kankanhalli (2009) explain user resistance using status quo theory. They suggest that there are three categories within status quo theory which included rational decision making, cognitive misperceptions and psychological commitment. Social norms fit under the psychological commitment category, which refer to norms in the work environment about changes which can reinforce or weaken the status quo bias of individuals. To test their claims, they conducted a case study of an IT services company with a random survey of 500 employees. Among their findings, they found that perceived value and organisational support for change reduced user resistance towards the new IS which was consistent with prior work. Further, the support of colleagues was also beneficial in reducing switching costs and smoothing the change to the new system. These findings suggest that practitioners need to develop the right climate for change, which echoes work by Klein and Sorra (1996), through training, guidance, time and resources to learn the new system.

Klaus et al (2010) argued that user resistance was at the heart of many ES implementation failures because users have a deep involvement in the extensive and complex process reengineering that can accompany ES implementations. They sought to better understand why users resist ES and also to determine if there were particular user groups that were resistant to ES. ES implementations require organisational change that can affect user's jobs, skills and values which can cause resistance. However, not all resistance is negative with some resistance providing valuable feedback of implementations that have negative consequences, for instance, in cases where an implementation may result in deeper problems than the benefits yielded from the system. The authors surveyed 110 ES users about their opinions about ES implementation, with 35 replies. They found that there were eight different user groups that emerged from the data which ranged from non-resistant groups, to resistant groups and others that complained or were impatient about the process. They also identified five important reasons for ES implementation resistance which included additional workload, lack of fit, technical problems, changed job and system complexity.

Finally, Klaus et al (2010) argue that there are 12 psychological determinants that can affect user resistance to ES implementations. The authors argue that ES implementations are a fruitful area for exploring user resistance because the systems are more complex than other software, they require mandatory use and users need to adapt to new standardised processes. User resistance can be beneficial in implementations if it can draw attention to problems or unresolved issues as part of the change. The authors argue that psychological contract theory could be used to examine resistance and drew on interaction theory and work by Markus (1983) to examine resistance further. The authors conducted a multi-method study that involved interviews with staff from a variety of organisations and roles. They found a number of issues that were classified as either individual, system, organisational or process issues. In terms of organisational issues, these included factors such as changes of power, communication and training.

So, this review of user resistance papers from the IS literature has some interesting findings that can be applied to this thesis. Of most interest was the work by Markus (1983) who discussed interaction theory, which suggests that resistance is determined by the gaps between the organisation and the system to be implemented. Kwahk and Lee (2008) and Kim and Kankanhalli (2009) build on this by suggesting that the organisation must have some

readiness for change in favour of the ES, if the implementation is not to be resisted by users. Lapointe and Rivard (2005) suggest that if users, or groups, are threatened by the ES, then this will also be an important factor in the resistance that occurs. Lastly, Jiang et al (2000) suggested that resistance could be due to system types and features of those systems while Klaus and Blanton (2010) suggest that resistance can also be due to a number of factors including individual, system, organisation and roles.

2.5 Implementation process models

Research on ES implementations has tended to focus on identifying which critical success factors (CSF) are important in ES implementations in order to explain why there have been such high failure rates in ES implementations (e.g. Nah & Delgado, 2006; Soja, 2006; Finney & Corbett, 2007). An alternative to the CSF view is the process view, which views the implementation project as comprised of a set of stages. The implementation can then be explained in terms of the various outcomes that develop across each stage (Markus & Tanis, 1999; Somers & Nelson, 2004). One important process model, which has been well cited in the literature, was developed by Markus and Tanis (1999) to examine ES implementations. The Markus and Tanis model is comprised of four stages which extended an earlier framework by Soh and Markus (1995). The model comprised the four stages of project chartering, configuration, shakedown and, onwards and upwards. The purpose of the framework is to explain ES success, and is useful for practitioners and researchers alike to understand the actions and effects at each stage that impact ES success. The model also recognises the holistic nature of implementations, such that the actions and decisions made in one stage can generate outcomes which provide the starting points for the following stage. Thus, unresolved, or unidentified, problems from earlier stages can accumulate and impact on later stages (Wei et al, 2005), which stresses the importance of examining an ES implementation across its entire lifecycle.

This study examines ES projects in terms of process stages that comprise the implementation. Three overarching process stages, adapted from the Markus and Tanis (1999) framework, are conceptualised - *pre-implementation*, *implementation* and *post-implementation*. This approach was used in the analysis of data as this study did not need to distinguish between stages during the implementation at the level of granularity implied by the Markus and Tanis (1999) four-stage model. Thus the three stages used in the reporting and analysis of the findings are mapped to the Markus and Tanis (1999) framework as

follows: (1) the *pre-implementation stage* includes the chartering stage, (2) the *implementation stage* includes the project and shakedown stages and (3) the *post-implementation stage* comprises the onwards and upwards stages. Next this thesis examines what each of these stages entails and how organisational culture could affect each stage.

2.5.1 Pre-implementation Stage

The pre-implementation stage (chartering stage) includes decisions and activities leading up to the funding of an ES system and the project to implement it (Markus & Tanis, 1999). This stage is essentially the planning stage, where key players like company executives, vendors, consultants and IT specialists will be involved in activities such as the development of business plans, selecting the ES, selecting the project manager and approving budgets and timelines (Markus & Tanis, 1999). Researchers have also examined some of the important activities in this stage. Nah and Delgado (2006) conducted a study examining the temporal importance of ES factors across different stages. They found that top management support and championship (TMSC) was the most important activity during this stage. TMSC is the support and approval of top managers for a project such that the project is designated as a top priority and that managers are willing to allocate valuable resources to the project (Nah & Delgado, 2006). Other researchers have stressed the importance of resource allocation in the pre-implementation stage as being necessary for project success (Al-Mudimigh et al, 2001; Nah & Lau, 2001; Al-Mashari et al, 2006).

Organisational culture may affect the pre-implementation stage and the literature provides some evidence as to what effect this may have. Studies have shown that the resource allocation behaviour of top managers could be affected by cultural values. Top managers must be critical in how they allocate resources because the escalation of resources into failing projects has much poorer outcomes for projects (Keil & Mann, 2000). Further, organisational cultures where confrontation is avoided by toning down negative messages may also be prone to the escalation of commitment (Chow et al, 1997; Keil et al, 2000). Similarly, organisational culture is also likely to affect the selection of the ES system to implement. For instance, Wang et al (2006) found that there were less initial misfits in implementing local ES systems than with implementing international systems. This is important because Wei et al (2005) found that unless such misfits, or misalignments, were handled in each implementation stage, then they could snowball across the project. Thus, locally sourced systems are likely to provide smoother implementations than international

systems because they have a better cultural match to the organisation. Likewise, Wagner and Newell (2004) also found that where organisations had a diverse organisational culture, then the selection of a system to fit such a culture would also be very important in determining implementation success. So, organisational culture is likely to affect the ES project during the pre-implementation stage with resource allocation and ES selection activities, in particular, likely to be affected.

2.5.2 Implementation Stage

The implementation stage (project and shakedown stages) includes all those tasks and activities that are necessary in order to fit the ES to the organisation, get it up and running and which help the organisation come to terms with the new system (Markus & Tanis, 1999). This stage ends when the organisation can resume normal operations after the implementation stage. This stage may also mark the passing of control from the project team on to organisational managers who come to be in charge of the new system. The key players in this stage are likely to be the project manager, project team, organisational members, vendors and consultants.

The implementation stage involves both hard technical tasks and softer social tasks. The technical tasks include important activities which involve configuration and customisation as well as modelling, testing, data conversion and integration tasks (Markus & Tanis, 1999; Parr & Shanks, 2000; Nah & Delgado, 2006). Parr and Shanks (2000) found that management support, a commitment to change and having a balanced project team, and the best people available fulltime to the project were crucial for project success in this stage. This stage is also likely to include many of the softer, social tasks such as training and change management. Training is important to get end-users up and running with the new system; for example, Peslak et al (2007) found that training was positively linked with end-user use of ES. Change management is also another activity in this stage which is important for project success (Seddon et al, 2010). Change management can be defined as those tasks that are necessary to reduce resistance, confusion, redundancies and errors that are caused by the large-scale change of ES implementations (Somers & Nelson, 2004). Thus, the greater the change, the more change management is likely to be a key task in this stage.

As with the pre-implementation stage, the literature provides examples which support the view that organisational culture affects ES implementations. One way in which

organisational culture is likely to affect the implementation stage is in how it influences decision making. Wagner and Newell (2004) argue that the best practices configured into an ERP tend only to meet the needs of the dominant group involved in decision making. This means that the system is likely to be configured towards the needs of the project team, who make most of the implementation decisions, even if most of these decisions are simply to accept the default setting (Pollock & Cornford, 2004). This is very important because when implementing ES systems in China, Reimers (2003) found that positive results in implementing ERP were associated with the delegation of decision making to the project team. Thus, it is important that the composition of the project team reflects the dominant organisational culture, so that the system can be shaped towards the needs of general users, rather than that of any particular subculture.

As with previous stages, an important theme in this stage is the necessity of cultural fit. In the implementation stage, cultural fit is achieved by developing a fit between the ES and the organisation, such that the ES may be adapted to fit better with the organisation's culture (Krumbholz & Maiden, 2001) and the organisations' culture reshaped to fit better with the ES if necessary (Boersma & Kingma, 2005a). This cultural fit can be achieved through decisions made regarding the configuration and customisation of the system and the fit of the values of the ES implementation to that of the organisation's users. For instance, Klein and Sorra (1996) argue that implementation effectiveness is a function of the strength of the organisational climate that surrounds the innovation and its fit to user values. Similarly, Cooper (1994) argues that organisational culture can inhibit the extent to which IT can bring organisational change, emphasising the need for effective change management. Further, Elbanna (2003) found that social integration was not automatically achieved in ES implementations and that this integration had to be built within the firm. Thus, organisational culture can be expected to influence the implementation stage because the difference between organisation values, and values embedded in the ES will determine how much change management is necessary. To this end, Ke and Wei (2005) suggest a number of behaviours that project leadership can use to shape specific organisational cultures that can support ES. Likewise, other activities like training may also achieve such outcomes.

2.5.3 Post-implementation Stage

Finally, the post-implementation stage (onwards and upwards stage) includes everything after normal operations resume, such as ES updates and upgrades, while this stage

continues until the system is replaced in the future (Markus & Tanis, 1999). In this stage the organisation will be able to determine what benefits the ES has brought to the organisation, as the cumulative success of cultural fit activities throughout the implementation will now be realised. As Cooper (1994) finds, too much IT adaptation during implementations can reduce the extent to which an IT can bring organisational change. This could mean that the organisation's implementation of an ES has resulted in a system that has failed to deliver expected benefits to the firm. Similarly, if there has been too little IT adaptation then the ES might not mesh with user values resulting in a system which users resist using (Cooper, 1994; Klein & Sorra, 1996). Therefore, the organisation will bear the brunt of implementation decisions made throughout the project. This will determine the success of the implementation in this stage and the benefits that are realised from it.

2.5.4 Summary

The preceding discussion has examined each implementation stage and shown how organisational culture could affect ES implementations. An important theme which has emerged is the importance of cultural fit between the ES and the organisation. This cultural fit reflects the similarities or differences between cultural values of the organisation and the ES. In resolving cultural differences, either the organisation must change to suit the ES, or the ES must change to suit the organisation. This discussion has also identified a number of activities and tasks throughout each implementation stage which are likely to be affected by the organisation's culture. This literature provides the foundation for this thesis to further examine how organisational culture can affect ES implementations.

2.6 Conclusions

So, in conclusion, the purpose of this review was to investigate the literature upon which this research is grounded, to discuss literature that may have some bearing on the findings, and to motivate the gap upon which this research can make a contribution to the literature. This research has the goal of examining how organisational culture can affect ES implementations. ES were found to be large, integrated systems that can have broad organisational effects which make them ideal for examining cultural effects (Klaus et al, 2010). Researchers have also been quick to point out that culture can explain much of the implementation failure that occurs in IS implementations (Bartis & Mitev, 2008; Kappos & Rivard, 2008; Jackson, 2011). However, despite its importance organisational culture is still a somewhat neglected area in IS research and practice (Bartis & Mitev, 2008).

Culture can be studied at many levels but this research focuses at the organisational level. National level studies have dominated the literature and there have been much fewer studies at the organisational level (Leidner & Kayworth, 2006). The organisational level was favoured because use of the national level is fraught with criticism (Myers & Tan, 2002; Jacob, 2005; Earley, 2006) and organisational culture analysis is a more fine-grained approach for investigating phenomena at the organisational level. The Detert et al (2000) organisational dimensions were chosen to provide an organisational culture framework for this research as they are suited for use within qualitative methodologies. They have been used specifically in IS to examine innovation culture (Khazanchi et al, 2007), organisational security culture (Ruighaver et al, 2007), IS implementations (Wang et al, 2007) and in ERP implementations to examine knowledge sharing (Jones et al, 2006; Palanisamy, 2007). These dimensions can provide the basis for broad cultural analysis while allowing comparisons with existing research.

To investigate cultural fit, subcultures and cultural dialectics, it is necessary to understand the theoretical framework to support the idea that cultural values can be embedded in both organisations and ES. Orlikowski (1992) drew on Giddens (1984) theory and linked it to information technology by arguing that there was the same duality between IT and social structures as there was between human action and social structures. An ES is then the product of human action which reflects the developer's assumptions about business rules, norms and values which are built into the ES. These values can then conflict with those of the organisation (Soh et al, 2003) which can create resistance and lead to implementation failure.

The application of embedded values in ES was seen with the review of the fit literature which examined studies that examined culture fit specifically and those that considered organisational fit in more general terms. In terms of cultural fit where there were differences in cultural values between the ES and the organisation then this could cause conflict and resistance (Cooper 1994; Klein and Sorra, 1996; Dube, 1998; Wagner & Newell, 2004; Strong & Volkoff, 2010). Cultural fit studies have so far examined values linked to MIS (Cooper, 1994), organisational climate (Klein & Sorra, 1996), software development practices (Dube, 1998) and ERP best practices (Wagner & Newell, 2004). Two studies were more closely linked to cultural fit in ES. Soh et al (2003) found four main forces from an examination of a

Singaporean hospital implementing ERP but with a focus more on structural elements than cultural values. Strong and Volkoff (2010) found six categories of misfits which included organisational culture. They suggest that these occur when the ES contravenes organisational norms but did not otherwise identify what these were. So, there are gaps in the literature for studies that explicitly examine what cultural dimensions are important for cultural fit towards an ES and whether these values are shared across different organisations.

This review also found arguments against the predominant view that culture is stable and persistent (Leidner & Kayworth, 2006). Instead, authors suggest a multi-faceted approach to examining culture (Kappos & Rivard, 2008; Jackson, 2011) which is better than treating culture as a stable variable. There was also support within the literature for the role of subcultures and their impact on IS implementations. Subcultural studies have tended to focus on identifying generic groups within organisations (Sackmann, 1992; Schein, 1996; Hofstede, 1998; Von Meier, 1999) rather than on how subcultures can affect implementations. Wagner and Newell (2004) investigated ERP systems in a university and did find that subcultures affected the implementation outcome. Likewise, Jackson (2011) examined virtual learning environments (VLE) and found that culture was not homogeneous while organisational subcultures integrated the VLE differently. Thus, the ES context has not been examined in any depth to determine how different groups may react to the integration and standardisation required by ES. Wagner and Newell's (2004) study of epistemic cultures and ERP implementation is closest but their focus was on examining how best practices differed across role groups within the organisation. They did not use particular cultural values to identify groups or examine how those subcultures affected the implementation.

This review found that dialectics are a useful method for analysing values within case studies because they could account for forces that could create conflict and change between entities. Dialectics represent competing forces, or values, between entities that compete for domination and control. As such, dialectics have been used in IS to explain electronic content management (ECM) systems (Nordheim & Paivarinta, 2006), organisational resilience (Cho et al, 2007) and collective mindfulness (Carlo et al, 2012). There have also been several empirical studies that have examined culture and ES. Robey et al (2002) examined dialectic learning processes in ERP implementations and found that ERP could be understood as a dialectic of learning based on three interviews each from 13 different

organisations. Soh et al (2003) used a case study of a Singaporean ERP implementation to iteratively develop four main forces that they found caused misalignments. Thus, there are large gaps in the research to apply an organisational culture framework model that can identify standardised cultural values in different organisations and determine what effects these have. This can build on the work by Soh et al (2003) by finding values and forces that can be generalised across different organisational types.

This review also examined SST and found that this could explain the mutual shaping of technology and the organisation during ES implementations. Findings from the few empirical studies that have examined social shaping have found the need for balance between customisation and configuration as both strategies may be needed for integration to be achieved (Ju & Wang, 2010). Thus, if there is not enough cultural fit between the organisation and the ES then customisation/configuration strategies can reduce this gap but at the cost of resistance towards the system. Indeed, findings from the user resistance literature find that resistance is usually determined by such gaps suggesting the need for the organisation to have some readiness for change (Lapointe & Rivard, 2005; Kim and Kankanhalli, 2009).

Finally, this review examined implementation process models which provide the framework upon which an implementation can be examined in stages. The outcomes of each stage can then be explained and analysed across each stage of the implementation (Markus & Tanis, 1999; Somers & Nelson, 2004). The Markus and Tanis (1999) model has been well cited in the literature and consists of four stages. Drawing on prior research, this thesis adapts the Markus and Tanis (1999) process model to define three broad project implementation stages for ES projects, namely pre-implementation, implementation and post-implementation stages. This chapter then examined each of these stages and the cultural effects that are likely in each stage. The review identified a number of ways in which culture could affect ES implementations and the process stages in which these were likely to occur.

Chapter 3 Methodology

This chapter examines the methodology used in this study. First, the epistemology is reviewed which show how technology can be embedded with values. Then the chapter examines the research design, data collection and data analysis for this thesis.

3.1 Epistemological Statement

Leidner and Kayworth's (2006) discussion of the embedded values in technology is consistent with social shaping of technology theory (SST). SST is a theory which advocates the view that the design and implementation of technology is patterned by a range of social and economic factors as well as narrow technical considerations. Thus, new technology is embedded with the cultural values of those who created it. Williams and Edge (1996) reviewed existing SST research to suggest that SST can provide a deeper understanding of the impacts of technology. Indeed, the authors explain that SST studies show that:

"Technology does not develop according to an inner technical logic but is instead a social product, patterned by the conditions of its creation and use. Every stage in the generation and implementation of new technologies involves a set of choices between different technical options. Alongside narrowly 'technical' considerations, a range of 'social' factors affect which options are selected – thus influencing the content of technologies, and their social implications." (Williams & Edge, 1996, p866)

An important concept of SST is that choices are made about the design of new technology which can have different impacts on social groups and society at large. These choices mean that certain social groups are able to 'shape' the technology to their own ends, while these choices often become irreversible as selected options become entrenched in the technology. Williams and Edge (1996) argued that this begins to coalesce when the implementation of technologies within organisations is examined. They note that it is not helpful to treat technology and social contexts as separate phenomena such that:

"This implies abandoning the preoccupation with technology as 'equipment' alone. Instead we require a schema which acknowledges all those institutions, artefacts and arrangements within which the adoption, configuration and use of those technologies

takes place – including the knowledge and expertise which have created technologies and are embedded within them.” (Dosi, 1982, from Williams & Edge, 1996, p 875)

Thus there is a constant mutual tension between the technology and the implementing organisation which cannot be separated from each other. This means that not only does the environment shape the technology through configuration and implementation, but that the technology can also shape the organisation to create new contexts. Thus, SST is a very useful theory for examining the social and economic impacts of technology beyond a consideration of technical factors alone. SST draws from similar ideas as Orlikowski (1992) and Giddens (1984) around the duality of IT and social structures. ES can have embedded values as a result of developer’s assumptions about business rules, norms and values which they build into the ES. These values have the potential to shape the organisation in various ways (Soh et al, 2003) as much will depend on implementation decisions that will determine how the system will be used. These values can then provide the dialectic tensions which can create conflict in ES implementations and which are examined in this thesis through case studies.

3.2 Research Design

The research paradigm upon which this study was that of “soft positivism” (Kirsch, 2004) which draws on the positivist-interpretivist blend of theory-building concepts proposed by Eisenhardt (1989) which allows for the data analysis to be carried out with *a priori* expectations (in this case, based on Detert’s model which is used to guide the examination of different cultural dimensions) while enabling for other concepts to emerge (from the ‘interpretivist’ perspective) as these relate to the tensions and consequences of cultural impacts on the organisation and on the ES implementation. Similar approaches have been used to explore IS-related phenomena where certain inferences (or ideas about predetermined phenomena) are combined with interpretivist themes that altogether allow for findings and explanations to surface (Kirsch, 2004; Ravishankar et al., 2011). Thus this research used a blend (or hybrid) of positivism and interpretivism to investigate the research questions. In this study we use the term ‘soft positivism’ (Kirsch et al 2004) to describe the research approach. Also known as *pragmatism* or *scientific realism* (e.g. Venkatesh et al, 2013) the approach used has as a key objective, the goal of confirming existing theory with regard to the validity of the cultural dimensions while allowing for new insights into the phenomena to emerge through the use of interpretivist research techniques.

From the perspective of positivism, this study draws on established processes in which researchers use a scientific or objective approach to observe reality and to make sense of it (Liu & Myers, 2011). Notably, positivism is the dominant approach used in the field of information systems with interpretive and critical approaches being the other two main paradigms used (Liu & Myers, 2011). However, though not a common occurrence there are some studies that have combined the various approaches to frame a hybrid methodology, as in the case of positivist-interpretive approaches, such as “soft positivism” (Kirsch, 2004; Ravishankar et al., 2011). Positivist research can involve quantitative, qualitative or ‘mixed’ methodologies which combine both approaches. A qualitative approach has the intention of generalising findings of theoretical concepts from data with theory being inductively developed. A qualitative approach can provide the basis for quantitative studies as theory can be developed which can be tested using survey research or other means (Eisenhardt & Graebner, 2007).

The intent of this research was to explore the nature of the effect of organisational culture on ES implementation. This justified the use of a positivist-interpretive approach so we could both explore the *a priori* dimensions and allow for other cultural dimensions or factors to emerge as well (Kirsch, 2004). Thus, a qualitative research methodology was deemed appropriate to better understand the phenomena in each case. This is especially pertinent when there is little existing theory on which to base the study, because, although the study is grounded in the Detert et al (2000) framework, there has been limited empirical research on the tensions and conflicts that may arise due to mismatches between organisational culture and that of the ES. Thus, it was important that while the examination of cultural tensions was being guided *a priori* by the Detert et al (2000) framework, that the method used would allow for those cultural themes and consequences that are key, to emerge from the case studies. Further, the use of cultural dialectics is a relatively new approach to understanding the nature of cultural impacts, which is best pursued in a case study setting that allows for the exploration and emergence of key themes from the case study data.

A case study approach was therefore selected as the appropriate research approach for this study within the soft positivism paradigm (Eisenhardt, 1989; Kirsch, 2004). Case studies are suitable when the area of research is relatively less well known and the researcher is engaged in theory-building types of research (Eisenhardt, 1989; Ghauri, 2004). As Yin (2003) notes:

“A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 2003, p13).

Case study research refers to the investigation of phenomena which does not involve the control or manipulation of variables and where the intention is to understand the phenomena within its context (Darke et al, 1998). Case study research is a well-accepted approach within the field of IS and there are many authors who have documented best practices in this area (e.g. Myers & Newman, 2007), and provided guidelines for how case studies can be conducted in a rigorous fashion. Further, a case study methodology is particularly well suited to examining the effect of organisational culture which would have been difficult to disaggregate from the body of the implementation otherwise (Pare, 2004). Case study research is also suitable when the phenomena in question cannot be studied outside the context in which it occurs (Dube & Pare, 2003). The use of a case study methodology is justified as multiple case studies are often more compelling than single cases alone. Further, multiple cases studies are more robust because more evidence is available which can be compared across cases (Yin, 2003).

In particular, the dominant key approach used in this study is that of a blended positivist case study with themes drawn from the interpretivist approach as posited by Eisenhardt (1989). Case study research within this perspective is designed and evaluated with the intention that the research deductions and observations are controlled and that the study is replicable and generalisable (Darke et al, 1998). Indeed, such case studies can draw on the existence of *a priori* relationships with phenomena that can be identified and tested (Dube & Pare, 2003), while allowing for other themes to emerge (Kirsch, 2004). This was used in this thesis with the consequent development of theory from the data collected from four different case studies. This approach has been used in IS by other researchers where the phenomena under question is not fully understood and where novel theory can be developed from the data (Kirsch, 2004).

From a positivist perspective, Pare (2004) developed a step by step scientific methodology to help guide IS researchers to conduct positivist case studies. Pare’s methodology consisted of four stages which included design of the case study, conduct of the case study, analysis of the case study and writing up the case study report. Elements of Pare’s methodology for the

development of the design of a case study are examined next with the development of the research question, prior specification of constructs, definition of the unit of analysis, case selection and development of the case study protocol.

3.2.1 Development of research question

Yin (2003) stated that one of the most important steps of research is to define the relevant questions of the thesis. Research questions provide a focus for a thesis and suggest the types of data that will be needed to answer such questions (Yin, 2003). The research focus for this thesis was identified based on the author's prior work (Stuart et al, 2009; Vathanophas & Stuart, 2009) in enterprise systems coupled with the observation that culture could be an important factor in the successful implementation of such systems. An examination of the literature confirmed that as an important area of study in which there were key gaps in current knowledge as regards the impact of culture on ES implementations. Drawing on key findings and gaps in this area, the form and focus of the research question was arrived upon. As identified in Chapter One, the research question of this thesis was to identify how organisational culture affects ES implementations.

3.2.2 A priori specification of constructs

The literature review identified the organisational culture dimensions from Detert et al (2000) as a suitable starting framework for this cultural analysis which was then used as an *a priori* specification of the constructs as allowed for by Eisenhardt (1989). This framework is comprised of eight dimensions (stability vs. change, concentrated vs. autonomous decision making, isolation vs. collaboration, hard data vs. personal experience, external vs. internal, process vs. results, internal vs. external, short term vs. long term). These were then used to help frame the research question in terms of how organisational culture can affect ES implementations.

3.2.3 Unit of analysis

Yin (2003) identifies the fundamental problem of identifying what the case is about as one of the questions most often posed by researchers. This provides the unit of analysis and shapes the boundaries that will limit the study (Miles & Huberman, 1994). In IS a unit of analysis could be a particular technology or system, a user or group of users, at IT position, an organisation or a decision (Pare, 2004). The unit of analysis could be any bounded phenomenon which exists within the case (Miles & Huberman, 1994).

In this study the units of analysis that were considered were the enterprise system (ES), the organisation and the ES implementation. The enterprise system was not selected as the unit of analysis because this study was not about enterprise systems *per se*, but about how cultural values within them could conflict/agree with cultural values within the organisation. In the same way, the organisation was not selected as the unit of analysis because it was the combination of the organisation and the enterprise system across the implementation which would answer the research question. Thus, ES implementation was selected as the unit of analysis because this could explain how cultural values within the ES and the organisation could combine and create conflict/agreement which could answer the research question. This also establishes the boundaries of the case, and focuses data collection on the implementation process and activities which had taken place and which participants could easily identify and discuss.

3.2.4 Case selection

Data was collected using comparative case studies (Yin, 2003) of four New Zealand organisations that had implemented an ES. A multiple case study design was selected to allow for cross-case analysis, comparisons and the investigation of particular phenomena across different contexts (Darke et al, 1998). Eisenhardt (1989) suggests that between four and ten cases are desirable for theory building using case study research. Further, selecting cases must be done so as to maximise the learning from the time available for the research study (Dube & Pare, 2003). Variability in context can also provide for more general results than single cases alone (Yin, 2003). Thus, four case studies were selected to provide both varied contexts and data sets to help answer the research question, within the limited time constraints for the thesis.

The case studies were selected using purposive sampling from a limited pool of organisations within New Zealand, which were in the process of implementing or had implemented an ES within the last 5 years. Convenience and accessibility to key persons were also important factors determining selection of the case studies. Enterprise-wide systems were chosen as these would involve more than one functional area, so that the fit of the system to the organisation as a whole could be examined (Davenport, 1998, Elbanna, 2003) as well as the impact regarding cultures and subcultures. The names of the systems

implemented, organisations and staff have been changed to preserve anonymity in accordance with the agreed on parameters of the study.

3.2.5 Development of case study protocol

To prepare for data collection, a case study protocol was developed for each case. Yin (2003) argues that case study protocols are an important method for increasing the reliability of case studies. A protocol is an essential instrument in a multiple-case study because it can contain the procedures and general rules that should be followed for collecting data in each case (Pare, 2004). Guidelines from both Yin (2003) and Pare (2004) were used to draw up the case protocols for this thesis. The protocols used provided an overview of the case study, field procedures, case study questions and an outline of the case study report.

This section examined the research design of this research. The next section examines how this was executed with data being collected.

3.3 Data Collection

As the data collected would be analysed to examine relations between different concepts, Eisenhardt (1989) suggests a number of points for this type of research which are detailed below along with comments as to how they were incorporated into this study.

- Guideline: Multiple sources of data collection should be used to strengthen the triangulation of evidence. This provides a stronger substantiation of constructs and hypotheses.

In this study project documents as well as the findings from multiple interviews were used to help triangulate and gain different perspectives on the phenomena under study.

- Guideline: Data collection can involve qualitative and quantitative approaches.

In this study, qualitative data was the main source for data collection. This was considered both suitable and sufficient for the purposes of the study. However, as will be discussed later (in Chapter 6, “Implications for Researchers”), quantitative data and supporting analyses can be used to explore the findings further.

- Guideline: An *a priori* specification of constructs can be used to shape the design and approach of theory building collection.

In this study, the cultural dimensions framework from Detert et al (2000) was used to frame the *a priori* specification and expectations regarding the study of key cultural dimensions and their impact in the ES implementation.

- Guideline: Researchers should avoid thinking about any specific relationships between variables and theories and leave this until the data analysis stage.

In this study, the cultural dimensions from Detert et al (2000) were used to frame initial expectations regarding which dimensions of culture to focus on. However the use of a “soft positivist” approach also allowed for the emergence and exploration of new findings, in keeping with the ‘interpretivist’ aspect of case study research, which was allowed in the research design (Eisenhardt, 1989; Kirsch, 2004).

- Guideline: Data collection and analysis should overlap with the use of research notes which comment on what is happening involving observation and analysis. Field notes could answer such questions like ‘what am I learning?’ and ‘how does this case differ from the last?’

In this study, research notes were used to reflect on key findings and make adjustments as needed to the case study protocol and analysis approaches based on the learning from the prior case(s).

- Guideline: Adjustments to the data collection and direction of the research should be made in response to themes that emerge from the data collection as noted below. (Eisenhardt, 1989).

In this study, the data collection approach was altered slightly after the first case study where it was found that there were no important differences in the effect of OC across different stages of the project. For instance, there were no stages in which conflicts were more evident than others with conflicts being likely to be spread across all stages. In subsequent case studies questions around stages were adjusted and although mindful of the possibility of such differences the main focus was on understanding the effect of culture across the implementation. Thus, as

recommended by Eisenhardt (1989) there were changes made to the themes that were emphasized during data collection and analysis.

The research design identified the organisational culture dimensions from Detert et al (2000) as an *a priori* specification of key constructs that would be examined in this thesis. Jones et al (2006) used the framework from Detert et al (2000) to examine cultural values and knowledge sharing in ERP implementations and used the framework to measure the cultural values of the project team. Work by Jones et al (2006) was also used to inform the methodology of this thesis study which involved the use of semi-structured interviews with questions based around each cultural dimension. An interview guide was developed that drew on the cultural questions, used by Jones et al (2006), but modified for an ES context.

Thus, data collection used semi-structured interviews to collect the case study data. The interviewer also used the qualitative interview guidelines from Myers and Newman (2007, p 16-17) to guide this process. These were:

1. Situating the researcher as an actor
2. Minimising social dissonance
3. Representing various “voices”
4. Everyone is an interpreter
5. Use mirroring in questions and answers
6. Flexibility
7. Confidentiality of disclosures

For instance, the interviewer would use mirroring to copy the language of the interviewee and use the terms they were familiar with. The flexible nature of these interviews also allowed interesting lines of inquiry to emerge and be investigated providing a full account of what happened in each study. Three different types of documentation were collected which included interview transcripts, project notes and project documentation. The interviews were all recorded and transcribed for analysis. Project notes were made before and after each interview and recorded in a project journal which meant that interesting points could be pursued across interviews to gain further information, clarify or assess different viewpoints. Project documentation was also collected where available to provide a further source of data that could be analysed and compared with the transcripts and project notes.

Project documentation involved screenshots of the ES, management briefing plans, rollout plans, targets and other materials.

Data collection involved interviews with a variety of personnel from each implementation. This included the project manager and other project staff, key stakeholders, management and staff from affected functional areas. Wherever possible a wide variety of staff were interviewed in line with Myers and Newman's (2007) guideline of representing various voices in the interview process. This helped balance the input of any one group and build a picture of each event from different points of view. In particular, this allowed for the triangulation of data from different sources. Ghauri (2004) argues that triangulation is extremely important to produce a 'more complete, holistic and contextual portrait of the object under study' (Ghauri, 2004, p 115). Thus, the input from a variety of staff was used to check, and validate different data and findings from the interviews to reduce the likelihood of misinterpretation and strengthen the overall validity of the data. As mentioned, often this was undertaken through follow-up questions put to different interviewees to help corroborate different facts about the case and the sequence of events that occurred.

So, having identified the general selection and data collection processes for each case, a full description of each case and those interviewed is detailed next.

3.3.1 Case 1 – Omega SMS implementation at Southern University

The Omega implementation was the first case study selected and doubled as a pilot study to examine the fit of the organisational culture dimensions and their impact in the implementation. This case study involved the implementation of the Omega student management system (SMS) across Southern University (SU) a public university in New Zealand. The SMS was deemed a central system for the university and involved an organisation wide implementation effort. In 2002, the university recognised the need to replace its existing legacy system because this was no longer able to meet the needs of the university. For example, the Vice-Chancellor felt that he did not have the financial information he needed to run the university effectively. A steering committee was established to investigate possible information systems which could address this need. The committee then evaluated several different information systems before selecting the Omega SMS as the preferred system. The proposal to implement the Omega SMS was then drawn up and in 2004, the decision was made to go ahead and implement the SMS. System

implementation began in late 2004 and the system went live in October 2005 for the new semester's enrolment. Once the implementation project was wrapped up in 2006, the system was passed over to a support team in the Student Administration department who were responsible for its ongoing management.

The case study began with a series of fact-finding interviews conducted with project staff and the head of the Student Administration department. These helped provide background information on the Omega project and introductions that were invaluable for setting up the focal study. Following these preliminary interviews, a case study protocol was developed to provide an interview plan, schedule of questions, and framework to organise the collection of data (Yin, 2003). Nine semi-structured interviews were then conducted with various staff who were involved with each of the four project implementation stages. The following table shows the role of the respondents interviewed for this study.

Table 3.1 – SU respondents and implementation stages they were involved with

Respondent role	Stages	Interview duration
Chair of Pre-Implementation Group	Pre-implementation stage, implementation stage	1 ¼ hours
Pre-Implementation group member	Pre-implementation stage	1 ½ hours
Project director	Implementation stage	1 hour
Project manager	Implementation stage	1 hour
IT project member	Pre-implementation to implementation stages	1 ¼ hours
IT project member 2	Implementation phase	¾ hour
Project team member	Post-implementation stage	¾ hour
Student Administration Executive	All phases	½ hour
Student Administration Executive 2	Implementation to post-implementation stages	1 ¼ hours

3.3.2 Case 2 – ResultSys Implementation

The second case selected was the implementation of ResultSys at the Southern Area Health Board (SAHB). ResultSys is a system whereby clinical results are centralised within a single system and made available to clinicians throughout the SAHB. The system is essentially a health information system (HIS) where the implementation involved a large portion of the SAHB including physicians, management and external testing agencies.

A project to make community results available was first brought up in 2002 and did not make much progress until 2009. Progress was slow as the SAHB did not have the platform

maturity necessary to support ResultSys. However, in early 2009, a group of clinicians involved in a concentrated block of management training, chose the development of a single project to make community results available throughout the SAHB. This was given the attention of the CIO who made the project a top priority for the organisation. A business case was developed for the project and funding secured. During project discovery, a similar system was found being developed at the Northern Area Health Board (NAHB) and after discussions the two AHB's agreed to collaborate on a joint project. Through this collaborative arrangement, the SAHB was able to leverage a lot of Northern's intellectual property (concerning the system development, privacy etc.) and move forward more quickly on the project. The implementation then involved two phases. Phase 1 began in August 2009 and involved getting the results into the data repository. This required the agreement of a large number of stakeholders to allow their results to be copied into the system. Phase 1 also included the design and setup of the technical system to store the recorded results and a standardisation phase to ensure stored results would be consistent. Phase 2 of the project involved rolling the system out to general practitioners but was outside the scope of the case study.

Three initial interviews with key informants began in August, 2010. These interviews led to the identification of other staff that could be interviewed and this process was facilitated by the project manager. Five more interviews were then conducted from November 2010 to February 2011. All interviews were conducted in person, except for one telephone interview with the NAHB consultant, who was located too far away for a face to face meeting. The table below shows the staff interviewed from the SAHB:

Table 3.2 – SAHB respondents and implementation stages they were involved with

Respondent role	Stages	Interview duration
Project manager	All stages	1 hour
IT executive	All stages	1 hour
IT executive and project manager	All stages	1 hour
Project member and head of standardisation work	Pre-implementation to implementation stages	1 ¼ hours
Application administrator and project team member	Pre-implementation to implementation stages	1 hour
Clinical IT leader	Pre-implementation stage	1 hour
Project systems architect	Pre-implementation to implementation stages	1 hour
Northern AHB consultant	Pre-implementation to implementation stages	½ hour

3.3.3 Case 3 – FoodCo’s SAP implementation

The third case study looked at the implementation of an SAP system at the Southern branch of Food Cooperative (FoodCo) to replace their legacy system. FoodCo is a cooperative comprised of a number of owner/operator stores, a wholesaling operation and a corporate organisation that provides a number of key services to member stores. FoodCo had their own custom, legacy systems, built up over a number of years, but which had become difficult and expensive to maintain. They were also reliant on key staff to maintain them, who were difficult to replace, while the system was not able to handle changes in the dynamic business environment they operated in. The decision was made to review their current systems with a view towards replacement. A project team reviewed a number of different systems before the decision was made to move to SAP, in part due to the financial justification for the system. The implementation then began at FoodCo and has been slowly rolled out to member stores through a specialist SAP team. The implementation was largely successful in meeting the project deliverables but went grossly over budget and failed to meet expected deadlines. However, despite the many problems in the implementation stage that occurred, the system is now delivering the expected benefits to the company.

The case study was conducted across October and November, 2011 and focused on the implementation of SAP within the corporate organisation of the company. The ongoing implementation into member stores is touched on, but remained outside of the scope of the case study. Twelve interviews were conducted with a number of staff involved with the project as detailed in the following table:

Table 3.3 - FoodCo respondents and implementation stages they were involved with

Respondent role	Stages	Interview duration
IT executive	All stages	1 hour
Procurement executive	All stages	1 hour
Project manager	All stages	1 hour
Retail executive	All stages	½ hour
Administration executive	All stages	1 hour
Project team member and merchandise executive	Implementation to post-implementation stages	½ hour
Project team member and retail executive	Implementation to post-implementation stages	1 hour
Chief executive officer	All stages	1 hour
SAP rollout manager	Implementation to post-implementation stages	1 hour
Project change manager	Implementation stage	1 hour
Wholesale operation executive	All stages	1 hour
Board member and member store owner	All stages	1 hour

3.3.4 Case 4 – Southern City Council’s SAP Parks module

The last case examined the implementation of an asset management system into the Parks department of the Southern City Council (SCC). The asset management system was essentially a reimplementing of the council’s existing SAP system to enable the use of SAP’s asset management module. This system replaced the disparate and individualised systems being used throughout the Parks department. The implementation involved reconfiguring aspects of the asset management module, reconfiguring its links to the finance module and the development of a business to business (B2B) interface to the council’s large contractors to schedule necessary asset maintenance through work orders. The Parks implementation would be the first of an ongoing project to rollout asset management to other areas in the Urban Environment Group (UEG) to which Parks belongs. Parks was chosen for the initial pilot because they had the weakest systems within UEG and they held a variety of assets that were used in other departments as well. The project also involved the development of asset standards which were adopted and revised from international asset management standards (IAMS). The incorporation of these standards would also be carried forth into these other rollouts.

The case study was conducted across two periods. The first two interviews were conducted in February, 2011, which provided the key background and initial data for the study. These

interviews were also used to identify other staff which could illuminate different parts of the implementation. These remaining interviews were conducted in October and November 2011. Ten interviews were conducted in total with a variety of project and organisational staff, as detailed in the following table:

Table 3.4 – SCC respondents and implementation stages they were involved with

Respondent role	Stages	Interview duration
Asset management executive	All	1 hour
Asset management team member	All	1 hour
SAP support team member	Implementation stage	1 hour
Parks contract manager	All phases	1 hour
Parks team leader	All phases	1 hour
Asset management team member 2	Implementation to post-implementation stages	1 hour
Asset management team member 3	Implementation stage	1 hour
Executive board member	Pre-implementation to implementation stage	1 hour
Parks contract manager 2	Implementation to post-implementation stages	1 hour
Project manager	All stages	1 hour

3.4 Data Analysis

Pare (2004) was also used to guide the data analysis of this study through four stages of analysis which were early analysis, coding, dialectic analysis and cross-case analysis.

3.4.1 Early analysis

Data analysis began in conjunction with the data collection process (Eisenhardt, 1989) with a project journal maintained for each case study. Pare (2004) also suggests that field notes can help identify themes and explore similarities and differences within the data and relationships between them. As such, before and after each interview, notes were made about issues that needed to be investigated, or further examined, and a log of questions was maintained. This helped develop a line of inquiry across multiple respondents. This was an important part of the research process, as field notes helped shape the later analysis as well as aid in the ongoing data collection (Pare, 2004).

3.4.2 Coding

Codes provide a tool for which the data can be reduced into smaller chunks which can be more easily categorised and analysed (Miles & Huberman, 1984). Once each interview was

completed, the author transcribed each interview into Microsoft Word. This was deemed important to help immerse the author with each case study and allowed additional reflection on the content of each interview and the tones and emotion conveyed. These observations became part of the project journal and fed into the results for this research. Then, all interview manuscripts were loaded into Nvivo8, a qualitative analysis software package, which can be used to help manage the coding process. All manuscripts were read through and coded into important issues and events (nodes) using an open coding process. These nodes were then cleaned up in two stages to remove matching nodes - first after each interview was coded and again when all interviews had been coded. The nodes were then organised and synthesised into a tree structure where related nodes were grouped together. This helped to document all the different issues in the case and serve as an evidence bank for subsequent analysis.

The first case study, Southern University's implementation of the Omega SMS, relied on an open coding methodology to identify important cultural values within the data (Kirsch, 2004). The purpose of this was to verify the Detert et al (2000) cultural dimensions and to determine how well the data fit these dimensions. This recognised the need to validate these dimensions before using them as a basis for the remaining case studies. From this process a number of cultural values were found and these were then categorised into the Detert et al (2000) dimensions to determine how well they fit. There was a good level of fit for these dimensions so data has been coded directly into these cultural dimensions for the remainder of the studies.

For each case study there was also a subsequent round of coding to specifically look for evidence of each cultural dimension within the case. This created a further evidence bank for that dimension within the case and showed all related data that could be found within the implementation. Following this, a case narrative was written up for each case study. The objective of the narrative was to provide a coherent story from all the different interview sources and to organise the implementation, and its events, from start to finish. The narrative could also be used to contextualise the ongoing discussion of the role of dialectics within each study by showing how these 'struggles' fit within the overall implementation.

3.4.3 Dialectic analysis

Next, a dialectic analysis was applied, to try and understand the forces at play within the case studies (Bjerknes, 1991; Robey & Azevedo, 1994; Van de Ven & Poole, 1995; Robey and Boudreau, 1999; Robey et al, 2002). The dialectic relationship was conceptualised between the organisation and the ES in each case study (Robey & Azevedo, 1994). ES can be viewed as a material artefact (Orlikowski, 1992), such that it is the product of human development which reflect the rules, norms and assumptions that developers build into the technology. The inherent cultural values of the ES can then oppose those of the organisation which may hold different values. Thus, there may be a dialectic between the different values embedded with the organisation and the ES which can be examined. To investigate the contradictions within this dialectic, the eight cultural dimensions identified in this research were used as a proxy for these contradictions. Each dimension shows the inherent struggle between two opposing values. For instance, the orientation to collaboration dimension, can be viewed as a contradiction between the opposing forces of isolation versus collaboration. These dimensions were then used to analyse the tensions within each study to identify conflicts between the cultural values of the organisation and the ES.

The data was then analysed to identify examples of struggles within the cultural dialectics in each case study and also cases where there was balance between values. The dialectic analysis approach was adopted from Cho et al (2007) so that for each contradiction, examples of *struggles* were identified as well as the *consequences* for each struggle. The *struggle* is evidence of tensions within the case between opposing values of each cultural dimension which are part of the organisation or ES. However, there may be no evidence of a struggle when the values of the organisation and ES are in agreement. The *consequence*, is the result of the struggle and its impact on the implementation. For instance, for the control, coordination and responsibility dimension, the struggle could be between the need for centralisation of processes within the ES, versus an autonomous organisation with many units with their own unique processes. A similar approach to detailing the evidence of dialectics was used by Soh et al (2003) where examples of opposing forces (i.e. the struggle) were detailed as well as the impact on the implementation (i.e. the consequence). The result of this process will be a list of cultural dimensions for each case study, evidence of any struggles that occurred between opposing values and the impact/consequence of these struggles on the implementation as a whole.

3.4.4 Cross-case analysis

Once the findings for each case were analysed, the next step was to compare these findings across all case studies. Cross-case analysis enhances generalisability because they help the researcher make sense of the data across different contexts (Pare, 2004). Cross-case analysis can determine whether results make sense from one case to another (Miles & Huberman, 1994). They can also deepen the understanding and explanation researchers can extract from each case (Pare, 2004). In this study we compared the cultural dimensions across each case study to examine similarities and differences in these results. We selected the most important cultural values for comparison to try and identify patterns, or contrasts, which could shed light on the generalisability of the findings from each case. Findings were then analysed with respect to the extant literature as part of the discussion phase of this research. This was useful because conflicting literature can provide a deeper insight into refining the developed theory or providing insight into its generalisability. Adequately addressing such conflict can also strengthen confidence in the developed theory. Overall, Eisenhardt noted that “tying the emergent theory to existing literature enhances the internal validity, generalizability, and theoretical level of theory building from case study research” (Eisenhardt, 1989).

In summary, this chapter identified soft positivism (also known as *pragmatism* or *scientific realism*) as an appropriate methodology to examine the research question that is, the impact of organisational culture on enterprise system (ES) implementations. This study uses the cultural dimensions of Detert et al (2000) as an *a priori* assumption that can be examined through the use of comparative case studies from four New Zealand organisations. The research methodology also allows for the exploration and uncovering of new concepts and phenomena that may provide a deeper understanding about what is occurring in each case. In particular, the use of semi-structured interviews will help ensure that evidence can be collected to both confirm and explore the research question. A dialectic analysis will then be used to examine the conflicts in each case with a cross-case analysis being conducted to better understand the phenomena under study and determine the extent to which the analyses and findings apply across multiple firms. Having discussed the methodology for this study, the next chapter reports the results that were found from the data collected from each case study.

Chapter 4 Results

In this chapter, we examine the results from the four case studies that were conducted; Southern University's implementation of the Omega SMS, Southern Area Health Board's (SAHB) ResultSys implementation, FoodCo's SAP implementation and Southern City Council's (SCC) enhancement of SAP. Southern university replaced their existing legacy system with the Omega SMS from a local software provider. The SAHB also implemented a new system, ResultSys, which collected test result data from community health labs and made this available to secondary clinicians in area hospitals. FoodCo replaced their existing legacy system with a new SAP implementation to realise integration and cost benefits. Finally, SCC had an existing SAP system which they enhanced to take advantage of SAP's asset management capabilities with a rollout to the Parks department of the Urban Environment Group (UEG). The results from each of these cases are presented next.

4.1 Case Study 1 – Southern University's Implementation of the Omega SMS

This case examines the Southern University's (SU) implementation of the Omega SMS to replace their existing legacy system. There were both internal and external pressures that were forcing change of the existing SMS at the university. The legacy SMS was a home grown student administration system which had served the university for a long time and was focused almost exclusively upon the maintenance of academic records. This legacy student system was maintained by a small staff of programmers working with, what was now, an obsolete programming language. The system also required increasing amounts of money to keep it running. In addition to these internal pressures, there were also external pressures to replace the system. The government had introduced tertiary sector reforms which actively encouraged universities to compete between themselves for students as student service was important. Further, the existing legacy system was staff-centric and had no capability to introduce new services to students that they were starting to demand. There was also increasing government reporting requirements on universities which the legacy system was struggling to meet. Thus, there was a clear need for a new system at the university.

In, 2001, a pre-implementation group was established to find out what users wanted from a new system. The pre-implementation group consisted of staff from many different areas but this diversity and overlapping interests often caused problems. Chief among these was the

involvement of IT who could not be impartial towards the selection of an external SMS that would see them lose responsibility and power within the university. This resulted in IT members being difficult and unwilling to make decisions which might hurt IT in the long run. The result of this process was a request for proposal (RFP) which was completed after 3 years. The Chief Operating Officer (COO) was then persuaded to release this to potential vendors and 12 different vendors applied. The pre-implementation group then began examining each of the different proposals which included visiting universities that used the systems. One of these bids came from the internal IT department but was evaluated as 'too risky' and subsequently withdrawn. From the group's work, a report was compiled which illustrated the selection process and how they had come up with the recommendation for Omega as the preferred system. This was due to it being a local system and the vendor guaranteeing that they could meet current and future government regulations which the international vendors could not do. The final decision on the SMS rested with the COO who ratified the group's recommendation.

The project formally began in October, 2004. The project was scheduled to have an 18 month timeline but was truncated to just 12 months. The primary reason for this was due to the movement to a continuous enrolment system where students would be able to enrol much earlier than before but which was a change the project team was unaware of. There were also new processes such as the movement to a new academic points system which also meant that the project would need to be completed earlier than scheduled. The result would be an extensive time pressure on the project and the need for rigid prioritisation as a result. In addition to the time pressure, there was also a very tight budget, which was not increased despite the reduction in time. The project team therefore had to reduce or remove some of the planned system functionality as they no longer had the time or money to support the original project plan. This impacted the implementation because the schools and departments had been sold on the need for a new SMS based on its extensive capabilities and configurability. However, due to the tight timeframe and budget, and the desire to standardise a lot of the university's processes, the project team did not plan to customise the SMS at all to meet department's needs. They intended a 'plain vanilla' implementation, so that the colleges would have to change their processes more extensively in order to use the new system.

This would cause problems later on as the legacy system had been tailored to the needs of departments and even individual courses. The project management sold the system to academic staff on its configurability to avoid any resistance from academics who would otherwise have resisted it. This was also the pattern throughout the project stage as there was little consultation of departments in the configuration of the system. The project team simply did not have the time, or inclination, to customise processes to each department due to the time constraints. To reduce inefficiency the university had to remove many customised processes in favour of standardised processes. For example, it was often said around the university that where you had 20 academics then you had 20 different ways of doing something. The downside of implementing new processes was in teaching a very reluctant faculty about the new procedures when they were very comfortable with how they already used the system.

The Omega SMS would also introduce other changes and responsibilities to the university as well. Foremost of these was the change of ownership of the SMS from IT to Student Administration. This affected IT's cooperation as they had a very strong feeling of ownership towards the SMS having been in charge of it since the 1970's. Another major process change involved the redesign of the payment process for students which affected the Student Administration and Finance departments because they felt like they were losing responsibility. Double-coding was another important issue that the project team had to face. Double-coding occurred when one department 'borrowed' a course from another and placed their own code on it. This amounted to three times as much work that needed to be done to maintain what was in essence a single course. Departments were resistant to this change because they were funded by students enrolled and double-coded courses meant they increased their student totals leading to more funding from the university. So, academic staff were threatened by these changes which could lead to them losing their jobs.

Finally, the project team also set students as the priority of the implementation. This was a radical shift for the university which was primarily staff focused. The project team celebrated this goal with their motto which expressed this as "Transforming the Student Experience." As such, meeting student needs was the first priority on configuration decisions and customisations. The main effect of this was with the usability of the system delivered to staff

as little work was done to improve the thin client ¹interface used by staff for the system. The thin client was difficult for staff to use as it displayed a lot more controls and information which made it more difficult and cumbersome to use. For students though, the project was very successful in transforming their experience. The system did away with the need to come in to the university and queue during enrolment weeks which was substituted with a quick, online enrolment process. The connectivity of the system also meant that other functionality such as library cards, building access and computer access were all easily enabled for students in a simple process.

So, the implementation stage saw the main configuration and customisation of the Omega SMS by the project team. The implementation is examined further in the next section which looks closely at three dimensions which were found to have affected the project implementation. Within each of these dimensions, the cultural tensions and struggles can be examined which caused some of the problems experienced within the implementation.

4.1.1 Analysis of dimensions

The implementation of the Omega SMS at SU is examined further in this section in conjunction with three dialectics which were identified as creating struggles throughout the implementation. These dialectics provide evidence for differences between cultural values of the organisation and the ES being implemented and are examined in this section. The results of this case study are summarised in Table 4.1:

¹ The term 'thin client' was used in-house to describe the largely text-based interface used by the staff to access the SMS, distinguishing it from the more graphical, user-friendly interface provided for student use.

Table 4.1 - Key cultural dimensions from SU case study

Contradiction (Cultural Dimension)	Identity	Struggle(s)	Consequence
Stability vs. Change (Orientation to change)	The university had been run in a settled fashion for many years and staff were unprepared for major change.	1) Staff were used to being insulated from change and were not prepared to become engaged in the change process or being involved in decision making. 2) Staff wanted to retain how they currently worked and did not want to learn something new, move to a different way of working or have changes in their responsibilities.	Some staff resisted the change to new processes, responsibilities and systems imposed by the SMS but others were more accepting as they recognised the problems with the existing system. Overall, the university has become more change oriented as staff are now more prepared, and involved, in change than before the implementation.
Concentration vs. Autonomy (Control, Coordination and Responsibility)	There was no centralised power within the university and strong autonomy exhibited by both organisational units and individuals with both largely free to act as they please.	The implementation meant the autonomy of many units' changed as they lost responsibilities and decision making authority, to more centralised functions. Particularly, with the introduction of standardised process which replaced the custom and individualised processes many units had.	Units that lost autonomy were resistant and this slowed the process down as top managers had to resolve disputes that occurred. Units are now treated more equally within the system as standardised processes affect all. Thus, the university has become less autonomous than it was before.
Internal vs. External (Orientation and focus)	The university was very internally focused as academic staff focused on teaching and research to produce the best graduates they could.	The internal focus was challenged by the newfound need to provide service to students and to prioritise student needs over staff needs to meet the competitive environment they were in.	The student focus meant the system was not customised for staff and many were discouraged by the subsequent poor usability. Processes also met student needs first even if this meant more workload for staff. Overall, there is now more of an external focus to meet student, government and environmental demands.

4.1.1.1 Change versus stability

This dimension examines the cultural values of change versus stability and the effect these had on the SMS implementation. Three areas are examined; the existing stability culture of the university, resistance towards the change management of the project, and resistance towards the new system and the processes it would bring in. This dimension shows that there were strong tensions between these values which affected the project.

The stability culture at SU

At SU, staff came into the SMS project with very little experience of change. The university had been run under the stable tenure of the Vice Chancellor (VC) for 20 years until 1998. That VC had made it a point to create a stable environment so that academic staff could focus on the core goals of teaching and research and be involved in as little administration or management as possible. This created a very conventional and traditional institution that was deliberately slow to respond to changes that came about from the external environment such as changes in government legislation. There was also a very stable population of academic staff who served under the VC and a number of these staff had very set practices as they had been in their jobs for a long time. They were not used to change because they had been 'insulated' by the policies of the VC and what little change had occurred had not concerned them meaning they were not ready for change.

The result was a very change resistant organisation as staff operated within a stable environment and had not developed the coping mechanisms needed to handle change. There were then issues for staff as they faced the replacement of various management systems around university and the newfound need to compete for students as a result of the change in government policies. Prior to the SMS project, the major change that staff experienced was the college restructuring which was completed in January of the same year the SMS project began. The project had run for about 2 years and there had been a fair amount of resistance to it involving many academic staff. The drivers behind both the college restructuring and the SMS project were in part to increase efficiency, to reduce the number of processes used and to improve how people worked.

So, previous, there were a wide set of processes that people would follow to get something done. With the college structure going in place that became less so. So that there's some more consistency put in place and the same thing was true with regard to

the Omega SMS. It was intended to create some more streamlined processes to get things done. (Project director)

So, going into the SMS project, staff had been exposed to some changes and were struggling between a desire for the stability of the past and the changes being forced upon them. While some staff had begun to embrace change, others became more resistant as they saw changes being made to the familiar ways of how they did their work. This struggle is examined further in the next two sections which look at this across the project and the system.

Stability versus change across the project

In this section, the tensions between stability and change are examined within the change management of the project and how it was run. The project was very slow moving in its early stages with about three years spent on the pre-implementation stage working out what was required and then engaging with vendors to select a final product. The slow process seemed to reflect the past stability at SU where there was a strong desire not to make hasty decisions that might affect the university adversely and an avoidance of change. The involvement of IT did not help during pre-implementation because they were very resistant towards changing the system. As such, there were more discussions than were needed and people were slow to make decisions. There was also hesitancy towards selecting an international vendor who might not have provided them with the attention they needed. There had been a lot of respect for Omega which was a prominent, innovative local business who had a standing for developing large systems and one which had a lot of past involvement with the university.

There was also a relative lack of engagement from staff towards the SMS project. This was a major change that would affect all staff. In particular academic staff were more eager to continue with their work which focused on teaching and research ahead of administration tasks.

Later, as things got up a head of steam, many people would simply be apathetic, it did not affect them, what's going to happen was going to happen, I'll get on with my [research]. It's good for them but there were no revolutions. I think that people were sort of happy to delegate to a team who were for some ... reason keen to do this job. (Pre-implementation group member)

Instead, academic staff were happy to keep putting the impending SMS project into the background and seemed to have a lack of appreciation of how this might affect them. Staff were also very busy, so it might have been easier for them to attend to more demanding needs than to project communications which seemed of lesser importance. This created the situation where staff complained that they were never consulted about the system despite the many forums and communications that were sent. Instead, what seems to have happened is that academic staff were disinterested in the project until they actually had to deal with it. Staff were then unaware of the rationale for change and felt disenfranchised from the process which was then a factor in the resistance that occurred.

So, while the previous cultural value of stability worked against the project, there were other factors pushing staff towards change. Chief among these was convincing staff of the need to change and the benefits of the new system. There was already a latent demand for change from staff who had grown sick of the poor performance of the legacy system and the lack of functionality they needed for their jobs. The legacy system was also paper based and there was demand for a system that could reduce the need for printouts being passed from person to person. As such, targeted messages were sent to staff to convince them of the need for change. These messages concentrated on the configurability of the new system, how it would improve the student experience and the need for replacing the existing legacy system.

It remained difficult [to convince people to change], there were people that thought, yes, this was important and it will make my working life easier. And if somebody held that sort of view then it would be easier to gain access to them. There were also people who, possibly, were of the opinion of "how does this affect me?" "Why is the university spending all this money? Don't we already have a computer system?" So if they had that sort of attitude it could still be difficult in most cases. (IT project member)

However, what was not told to academic staff in particular was that although the system was very configurable, the project team intended a 'vanilla' implementation of the system which all faculties would share. The intention was to standardise processes and improve efficiency across the university. Of course, if academic staff had been aware of this then they probably would not have allowed the change to have gone through as there was past history of academics blocking projects that they did not approve of. So, the intention of overselling the flexibility of the system had always been a tactic by project management to prevent such

a situation occurring because they knew the standardisation in the project would not be popular. They also had very little time to implement the project so they could not take the risk of being bogged down in too much consultation when they did not have the time for it.

There was a need to push people towards change as time was against them. While the college restructuring had affected many people, their day to day work had not changed. In contrast, the SMS project had a much larger impact on staff as it changed how they did their day to day administration work regarding students, which they still had to do while they learned how to use the new system. Due to the scale of change needed, the selection of Project Director (PD) was critical, as the person selected needed to have the organisation power and relationships to keep the project moving despite the resistance that occurred. The PD could always sit down with resistant groups to discuss the best path moving forward. There were also a number of presentations held across the university to engage different groups as well as regular newsletters and emails too. Interest varied and academic staff only became aware of the system when they were informed of the need to complete training in Omega.

Academic interest, I think, really came in when we got to the point where we said “right, everyone has to attend some training.” And I think it was 3 and a half hours in total. And if you do not attend the training then you’re not getting a login. (Project member)

This involved around 3-4 hours of classroom and laboratory based training where staff were shown how to use the system based on the functions they were involved in. Training was essential to change how staff worked, and how they would need to work in the new system. Some departments handled this well while others struggled. For instance, Business and Economics were well organised and handled training well while Engineering struggled due to the custom processes they were used to using. The effect of the training though was to push people to change as they had to invest their valuable time in training where it had been easy before to avoid the project when it had been just meetings and email.

Resistance towards the new system and processes

The struggles within this dimension were further seen with tensions between the desire to retain the existing legacy system and processes and the need for change to the Omega SMS. The legacy system was firmly entrenched throughout the university so it was difficult to move people over to the new system. Where there were tensions with staff, or where staff

were resistant, the PD would talk to them to try to resolve the issue or escalate the decision to higher authorities if it could not be resolved. Often, conflicts were resolved with a quick discussion where the problem had been borne out of stress of the change and tensions with other members of the project team.

So we just did still strike some resistance. But, all I had to do was escalate it when that was necessary and the word would come from on high. Fortunately that was infrequent. Typically, I had to go out and have a cup of coffee with somebody and sit down and find out what's the problem here? Can we talk through why you cannot help us, or why you're resisting, and sit down that way. Sometimes it was just a personal clash between one of my team and that person and I could smooth away and things would be cool.
(Project director)

This resistance occurred because the new system meant a change in the way people work. With the legacy system, much of the work was done in the background by a large group of people in Student Administration. With Omega, the work processes for student administration became more decentralised as academics and faculty administrators were empowered to make more decisions and become more involved with the process than before. With the legacy system, some of the work processes and decisions made by Student Administration were passed to academic staff thus increasing their workload. This was not received well as academic staff saw administrative work as being of lesser importance than teaching and research. So there was resistance among the academic staff to taking on these new responsibilities. There was also resistance from academics who now had to use computers to handle processes that were always done face to face before. For example, academics still wanted students to meet with them for academic advice while many students were happy to use a computer to plan their courses.

There was also resistance as staff have had to move from a system they knew how to use, to a new system they would have to learn to use. The legacy system had been customised and developed over many years to fit the needs of the university. For example, staff were used to seeing customised screens which displayed only the information they needed as they had been able to get IT to remove system features or information they did not need. The move to Omega meant moving to a packaged, standardised system that was not fully customised to staff needs. The largely text-based interface had more information than most academic staff needed because it was used by a wider variety of users both at SU and in other

institutions that used the system. The project team had the option of customising the interface for Go Live but there was no budget, time or desire for that. The result was that the SMS was not as usable or user-friendly as the legacy system; it was therefore difficult to use and there was very little documentation available to support use. Instead, many staff opted to make decisions on paper and hand those to administrators to input into the system. Thus, the staff level of satisfaction with Omega was very low, although this improved over time as new changes to the interface were made.

The level of satisfaction was initially much lower from staff because they had a system which they were already used to and we had to move them across to this one. The system they were used to, to a new system. I think the level of satisfaction has improved quite a lot in the ensuing time. There is probably still, to be fair, some room to move on that set of users. (Project director)

The SMS project also meant that staff needed to use computers for more of their work than with the legacy system. This created resistance from staff who were not comfortable using computers or who had no desire to use them. For instance, staff in SA and Finance had to pass an IT skills checklist before they could do any training and one person chose to retire rather than face the prospect of computer use. Staff who signed and stamped pieces of paper now needed to complete the process online. Some could not handle this and SA allowed the process to continue although they have been slowly clamping down on this practice as it is still necessary to account for papers which show decisions that were made. These cases illustrate staff and administrators who were not computer literate and were unwilling to convert to the use of computers.

Finally, the legacy system was developed and controlled by IT who had reaped a lot of power within the university from their management of the system. IT were the ones who controlled development and other faculties had to come to them to request changes to the system which were done at the convenience of IT. However, this created a lot of dissatisfaction from those outside IT who were not happy with the service provided to them and wanted a fresh start with an outside vendor. IT therefore had to be managed with 'kid gloves' as they had a very important role to play in the project and addressing problems that may arise.

As such, there was tension between retaining the status quo and the desire for change into the new SMS and ownership structure. IT were unhappy with the loss of the maintenance of

the legacy system and the change in ownership of the system to SA. This created resistance and manifested itself throughout the lifecycle of the project which remains a cause of friction with SA to this day. During pre-implementation, IT served to befuddle the process and were always looking to defer decisions whenever possible. During the implementation, IT's resistance was very passive and anything they were in charge of struggled which included both the data migration, which was not completed for Go Live, and the interface development.

Consequence

The consequence of tensions during the Omega SMS implementation was resistance from staff which affected the initial take-up of the system. Staff had issues with the usability of the system and were turned off the system because the interface and usability were poor. This was due to the project team's lack of time and the prioritisation of work to students. Staff also resisted the SMS because they were led to believe that it would be very configurable while the project team had no intention of allowing academic staff to configure it individually. These issues led to resistance of the SMS although this has decreased as older staff have left and newer staff accept the use of the system in their jobs.

I think it was acceptance really. And I don't think we are really quite there yet. As people have, we are now at the point where, how many years is it? Three? And, there has been some changeover of staff and I think that helps, but ... there is [still] a lot of misinformation out there about Omega and still ... [a great deal of concern] amongst quite a few people (Project member)

The change from the legacy system to Omega also meant that IT were largely resistant across the whole project. This manifested itself in both the interface development and the data migration. For the interface development, three staff were responsible for the development of the interface between Omega and other university systems which included building access with ID cards, library access and the purchase of services across campus. This part of the project was behind the entire time of the project and the project team had to eventually replace these staff with others in order to have it finished on time. There were similar problems with the data cleansing and migration and again, while all other areas of the project came in on time, this area struggled. In the end it could not be done on time and had to be phased in so that data not migrated would be completed after Go Live. In both

cases, IT staff were seen to be reluctant and raise problems at every opportunity, without providing solutions, which tended to affect the morale of others on the project.

For the organisation as a whole, the SMS implementation built on the changes of the college restructuring and brought change to almost every staff member. People had to change how they worked in order to use the new system. Many could not handle the change and the consequence was resistance. Others, became more accepting of change and the benefits that it brought them. For instance, different groups stepped forward with ways to improve the current system and make it easier for people to use. The ongoing development of the interface was also linked to feedback from staff and their ideas for improvement. This included online scholarship applications, engineering practical work records and student advice. There was also a lot of demand to bring student advice into the system to store the advice given by academics to students. This could then prevent students from receiving conflicting advice from academics and also serve as a record of the time they spent giving advice.

So, the university had a very stability oriented culture which was challenged by the many changes that needed to be made to support the Omega SMS. These changes have resulted in some staff who were still very resistant to what occurred, but also staff that became more receptive to change as a result of 'surviving' the radical changes they had to deal with. As such, it was likely that the SMS project moved the university towards becoming more change oriented which was evident in the desire for staff to make continued changes to the SMS to solve other organisational problems and to improve processes. This was a lesson learned of the Omega project where they have found change easier to make when it was led by demands from the organisation rather than imposed by management. However, this newfound demand for change from the organisation was a part of the change in values towards becoming more change oriented as well.

4.1.1.2 Concentration versus autonomy

In this dimension, tensions between forces promoting autonomy and those promoting concentration are examined to determine their effect on the implementation. This is examined in three sections; the cultural environment of SU, the changes to unit autonomy due to the implementation, and the tensions due to the standardisation of processes. These show that there were strong cultural tensions between these values which affected the project.

The cultural environment at SU

The university had recently undergone a restructuring that created more hierarchy. Previously the university had a flat management structure with each head of department (HOD) directly responsible to the VC but the restructuring changed this layout with the introduction of Pro Vice Chancellors (PVC's) who HOD's now report to. The result was an organisation that had moved from a more collegial structure to one that was more hierarchical and centralised although this differed to the hierarchy that exists within private firms. Academic staff had a lot of autonomy to act as they pleased with academic autonomy being one of the core values within the university.

And of course the hierarchy, is not a hierarchy in which you have superiors or subordinates. I remember doing the academic audit of [another university] and we had a management man from industry. And he could not understand it. He just presumed that a senior lecturer could give instructions to a junior lecturer. "No, no." I would said, "It does not work that way." No rewards coming from bossing people. Just worries. (Pre-implementation team member)

Indeed, even the VC did not directly order people around with a more collegial approach expected where people were persuaded towards a course of action rather than having it dictated to them. However, this could be difficult to achieve if the staff member did not have any interest in the proposed course of action. This explained the popularity of committee decision making as it could bring different groups together, although the downside was slower decision making as the committee worked out the best course of action. Indeed, using committees was a tempting option for university decision makers instead of making decisions by themselves.

The academics also had a lot of power as a group and they had a lot of influence over decision making. In the past, projects were stopped as a result of academics mobilising against a particular course of action they did not support. So they can be a powerful obstacle to change if not brought on board to proposed change. The academic autonomy that existed is based on the idea of academic freedom where academics were free to research what they wanted and have freedom of thought with their ideas. Some staff took this too far though believing they could comment on anything at the university whether they were an expert on the issue or not. Further, the loyalty of academics to the organisation was sometimes in

question because they were often heavily involved with their graduate students and academics globally within their field. Thus, they were more inclined to pursue the academic ideal rather than attending to the necessary minutiae of working within an academic organisation. This was something that the SMS project management wanted to change for this implementation because they understood that if academics did not want to do something then everything could just stop. With the Omega project under such tight deadlines and everything agreed to proceed from a certain date, then it would have been catastrophic if the project had been stopped by academics who did not understand the changes or who were unwilling to move to something new. Thus, there were tensions between the need to control the project and keep it going versus the autonomy of academics and the power they had to prevent change from happening.

The university also has a lot of unit autonomy as the university was almost like an umbrella with a whole lot of separate companies within it. Each college within the university makes its own decisions as does each department within each college. Decision making is decentralised as units make their own decisions about things like purchasing. There are also divisions between academics and service units who sit within their own organisational units and report to separate PVC's. Within the colleges themselves there are also divisions as academic managers and college managers are very separate despite making decisions that affect each other. Thus, it could be difficult to implement change across all these different groups when they were so divided and there was so little interaction between each group. Indeed, internal communication was a major problem as units rarely talked to others outside their own spaces which has remained a problem despite efforts to try and change this. This also made it difficult to develop good management within the university as managers do not have to account to each other for their decisions as each unit is run autonomously. Unit managers were not used to being told what to do by others and were accustomed to doing the job the way that interested them or fit the needs of their unit.

And so, from time to time when you do a project like this, this might be the first time that staff have been asked to change something. What I've found when gone to do some other jobs is that staff have become accustomed to developing the job in the way that interests them. And if I'm coming along and saying, "well actually, the requirements of the job are now this, and you know it's not a major change and you've

got the skills to do this, and if you've got a bit of a gap here then we're going to provide this training." That's my job to do this. (Project member)

Thus, there was a management culture towards an autonomous style of management. There was also a lot of competition and rivalry between units as they competed against each other for funding. This competition could get very intense at times. This then made it difficult to create a single call of action across the university when organisational units had their own agendas and goals. Next, tensions across the project are examined before the discussion turns to tensions around the change of processes.

Changes to unit autonomy across the project

On the project there were also tensions that affected the implementation involving the changes to unit autonomy that would result. In the pre-implementation stage, the pre-implementation group determined requirements, assessed candidate systems and recommended a final system to the COO. However, the final decision on which system to implement rested with the COO and the senior management team while this decision also had to be approved by the university council. On the project there was also a centralisation of decision makers that occurred. This was seen with the creation of a steering committee, chaired by the COO and made up of all the key senior management people involved with the system. This group then acted as the final arbiter to resolve disputes that occurred on the project although the group was only advisory to the COO and the COO was the final decision maker on any decisions that needed to be made.

There was a steering committee that was chaired by the COO who had the key senior management people who were involved in the system. ... So some decisions would escalate to that group. There would be robust discussion and the decision would sit with the COO (Project director)

Using committees did help bring people together and have everybody working in the same direction. This was the same structure used by the project team as well. There was a decision hierarchy that established the boundaries of decisions that team members could make and those that needed to be made by project management. Project management decisions were typically those involving end-users of the system and cases which affected other project groups. These decisions were made or escalated to the steering committee if necessary. Team members were also responsible for delivering certain objectives on the

project and determining when such objectives were completed. So, team members were largely autonomous but worked within the confines of a centralised structure.

The project also sought to establish the SMS as a critical business service that would be shifted from IT into another unit. IT had been heavily involved with the legacy system but it was felt that it was necessary for the SMS to be placed under the ownership of SA because the enrolment system was such a critical activity for the university. Outsourcing the SMS to Omega also meant a loss of the existing maintenance work of the legacy system by IT as Omega would now do any modifications or upgrades to the system that were needed. Centralising the SMS meant that SA had much more control over the system than they had before. IT has never given much priority to the smaller changes that SA needed from the system in the past and now SA were able to make changes much faster. For instance, if the legacy system had any problems, they would have to log it with IT and then it could sit in a line with all the other jobs at the university before being done. During enrolment times this was not acceptable as it could have meant students not being able to enrol if the problem affected that process. Now, there are much faster response times with Omega and SA can also better monitor the system and identify problems before they affect student service.

The centralisation of Omega came at a cost to IT as they lost control over a major system of the university and one which had given them a lot of power throughout the organisation. Thus, there was resistance from IT across the project. In the pre-implementation stage, IT staff were slow to make any decisions that would hurt IT as they tried to serve the dual purposes of protecting their own staff while trying to serve the needs of the university. They had 'skin in the game' but they were also the ones who were involved with implementing the new system as well. This conflict affected the decision making in this stage and slowed down how quickly the project team could move.

So, they (IT) were really unhappy, and the COO was saying to me, "you've got to get the guys onside." And I'd say "No, I've got one year to get the project done. I have not got time" [It was then very slow] ... which meant that we had to put in a temporary interface which involved going through the old student system. And then it was [not until] six months after the project went live, that they finished the proper interfaces. That was a very challenging piece. (Project manager)

On the project, IT were in charge of the delivery of the interface between Omega and the existing systems at SU but this was not completed as scheduled as IT progressed slowly on finishing this piece of work. Further, the interface did not work as expected as it incorporated its own logic to determine if someone was still enrolled or not, which could often differ from the criteria which Omega used. These actions and outcomes were contrary to the goals of the project and at times challenged the morale on the project team as they tried to work through the issues with IT and various staff to achieve the goals of the project, and overcome the actions of a few key persons who were hindering the progress of the project.

Tensions around standardisation of processes

The SMS project was intended to standardise a lot of the unique and custom processes around the university which were costing the organisation money. There was a strong desire from SA and higher management to remove a lot of the variations in processes around the university because it was dubious whether they were adding value for students in addition to the increased costs of maintaining them. For instance, a couple of courses wanted students to come in and talk to the lecturer as part of the enrolment process but that was not reasonable as a standardised processes to make it necessary for all students to have to come onto campus to do this. So, a lot of the project team's work involved decoupling the administration from the key processes needed to enrol students. There was also a very small budget for the project and to maximise that budget the project team planned a 'plain vanilla' implementation. In other words they sought to implement the system with as few customisations as needed with the intention that the organisation would adapt to the new processes.

The most challenging thing ... is that we only had a year to get this done. And while [we] had gone out and said that Omega's wonderful and it's highly configurable, what [we] did not say to them was, yes, it's highly configurable but like Henry Ford, you can only have it in black. And where we ran into difficulties, is, as Science would say, well we need you to do this, and Law said that we need you to do this. And we said, no it's only going to be one way. And, so some difficulties fairly quickly emerged that there was an expectation that things would be tailored to the needs of individual colleges or down to individual course levels as had been done in the previous system. And that was certainly not going to be part of what we could accommodate. (Project member)

This standardisation meant new processes for staff that they had to learn how to do which academics did not readily accept because administrative work had such low priority for them. They preferred to continue with what they knew already so they would not have to invest time in learning new process. So, the SMS project was not just about a new system for staff to use, it was also about streamlining, standardising and reengineering processes to make the university more efficient.

It makes it very difficult because we'd like to have one process that is applied to enrolment but Engineering is always asking us to do something a little bit different, and the same with Law, and then putting Education into the mix as well. They do things completely differently because they were their own autonomous unit for many years. They've struggled greatly to fit with our process and we've struggled greatly to get them to fit into ours. (Project member)

Indeed, it was very difficult to incorporate all these different unit processes because many of them had been autonomous for so long that they had developed very different processes compared to what others used. Thus, there was a real struggle during the project between the SMS and the university to try and bring these processes together. For instance, one rule that annoyed a lot of people was that the SMS automated the processing of applications for all colleges in the same way which provided a flexible approach to students in how they gained their qualifications because they could easily include subjects from different areas. SA stated that these processing rules must now apply to all colleges equally; however the legacy system often had unique rules that customised the process for different colleges. SA did not accept this because it would slow down the system too much and reduce student flexibility in enrolment. The unique changes colleges asked for included whether a course enrolment required HOD approval or not, but having conditions attached to the need for that approval that they could individually set. Another unique 'rule' lay with workload checks where Engineering wanted a different workload check compared to Education. In both of these cases, if there were separate rules for each college then it increased the system complexity in trying to determine how each check would apply to students studying in more than one college.

During the project, focus groups were one method used to consult with units about process changes. Of course, everybody wanted changes, so there was a very clear decision making process on issues that could not be resolved which involved escalating to higher authorities

when it was needed. Of course, setting the expectation initially that the system would be very configurable certainly did not help users to accept that they would need to change to standardised processes.

And we said, no it's only going to be one way. And, so some difficulties fairly quickly emerged that there was an expectation that things would be tailored to the needs of individual colleges or down to individual course levels as had been done in the previous system. And that was certainly not going to be part of what we could accommodate.
(Project manager)

There were also some major changes in unit responsibilities as processes were changed. As mentioned earlier, IT lost the ownership of the SMS to SA. SA also had to deal with the loss of administering student loans to the Finance department. It just made sense as part of the process to separate student loans from the other work of SA although there was fierce resistance around this. SA felt this change meant they were losing the important work of student loans to Finance and there were fears that this would lead to people losing their jobs. As such, they resisted this decision and this provided an example of a decision that had to be escalated and was eventually resolved by the VC.

Another process change that would affect many units was the intention of the project team to get rid of double-coding. Double-coding occurred when a course taught in one unit was given another code and incorporated into another unit. These then look like separate courses even though they use the same lecturers, have the same students and are taught in the same classrooms. The problem with double-coded courses was they meant more administration as there were two or more courses where fees, pre-requisites, descriptions and enrolments had to be managed. So it was mooted to get rid of this to save costs but this was heavily resisted because it stripped some departments of courses and the students that came with them. Departments were funded on the basis of student numbers so the removal of double-coding threatened a lot of staff because they feared their departments would lose funding and they would subsequently lose their jobs.

It ended up being political between departments and colleges. It ended up being due to EFTS and funding. And, that is why they convinced the powers at be that it would have to stay but they were all given certain timelines and that gradually they would have to disappear. (Project member)

So there was a lot of resistance against getting rid of double-doing and the resistance was sufficient to force a decision from the VC. The VC decided to retain double-coding but units were given certain timelines for when double-coding would have to end. The centralisation of data into one place also changed the management and access for that data restricting it from those who had access before. For instance, the mentoring programs wanted access to student transcripts to help identify mentors but they were denied by SA because they believed that it should be up to the student to opt into mentoring programs rather than being 'head hunted' for them. With the legacy system, everybody had access to the system but now, SA more tightly controls access and only provides it where there are genuine reasons for doing so.

Consequence

Thus, there were tensions between autonomous units who competed with each other and the centralised control of the project team pushing a new system and standardised processes. Within the university there was a style of leadership from senior management downwards which encouraged internal competition and led to a competitive internal environment. The restructuring was an attempt at more centralisation to reduce the autonomy that existed but this seemed to create more distrust in the organisation from staff at the ground level. On the project, the shift of the SMS from IT to SA resulted in a lot of resistance from IT. Afterwards, the project management admitted that it might have been better to have brought in outsiders to manage the IT work rather than to use internal IT who were not happy with the changes.

The movement to the SMS was a success though because SA found that they could now make changes more quickly to the system and it has become a central part of how they operate. However, there were also tensions with academic units because they no longer enjoyed the 'specialness' they had before as each unit was not treated equally within the system. Decision making was also pushed back to academic units so they could manage their own systems within the confines of the standardised system. This came at the cost of additional workload but provided more transparency for colleges so managers could better control their own finances through better visibility of data.

Lastly, it was important to have top management help push through the process standardisation that occurred. This was seen with the steering committee and the VC having to rule on controversial matters that would otherwise have affected the efficiency benefits

of the system. One mistake though may have been marketing the system to staff as being configurable when the project team had no intention of customising it like that.

I think this is exactly the one where it's saying that Omega's highly configurable and we can do all these things but being just a little bit quiet about while we can do these things we are choosing not to do these things. And, just the way that was presented, I think [we] probably [should] have been more, a little more, upfront. (Project member)

This seemed to have created a lot of resistance that endured after Go Live. One of the effects of this was the emergence of so called 'feral systems' that were a response to the loss of control over processes that units had. These systems take data out of Omega and then operate on it in some fashion before feeding it back into the system. Because SA does not allow systems to feed data directly into Omega then any such feral system would involve quite a manual process of re-keying data back into the system. SA were aware that some departments were using such an 'add-on' system already. Indeed, while this may be of some benefit to the departments concerned, it did not improve overall efficiency across the university so this was largely considered a negative outcome of the project to some extent that affected system benefits.

So, within this dimension, tensions between concentration and autonomy were examined. The SMS was a concentrating force that standardised many of the unique processes that existed. The SMS also concentrated much of the decision making power within SA and reduced the autonomy that departments and IT had enjoyed before. The result of these tensions was resistance that occurred throughout the implementation and which has continued to endure. Despite this, the culture of the university seems to have become less autonomous. Units have lost some of their autonomy as their custom systems and processes have been replaced by standardised processes which they have little control over. The standardisation of these systems has created more concentration such that it was likely that the culture of the university became more concentrated as a result of this implementation.

4.1.1.3 Internal versus external change

In this dimension, tensions between internal versus external forces for change are examined to determine their impact on the SMS implementation. Principally, this involved conflict around prioritising student needs over staff needs which reversed the prior staff-oriented culture at the university. This led to strong tensions across the implementation.

There were a number of internal pressures for change as the system had become difficult to maintain as it had been in operation since the 1970's and become reliant on a core set of staff who were difficult to replace. The system had also been continually patched to make changes that it had not been original designed for and these meant the system was unstable. Indeed, there was a growing risk that the system was coming to the end of life and could 'fall over' at some stage in a crash that could be difficult to repair. There was also no interface with the financial system so the systems never reconciled together. The university was also running out of course codes as the system needed a new course code each time a course was run. There were also problems with student ID numbers as they were likely to run out of numbers for students in 2010 because the numbers had been used for previous enrolments. So, there were very strong internal pressures that drove the need for a new SMS.

There were also demands to improve efficiency throughout the university. The legacy system had become very expensive to run due to the reliance on expensive core staff and the amount of time they had to spend to keep the system running. There had also been a movement to increase efficiency throughout the university as a result of prior restructuring. Faculties and departments used many different processes and there were many administrative staff to support all those different ways of doing the same thing. So, there needed to be a standardisation of the processes at the university which could reduce the administrative burdens. There was also no way of adding online enrolment to the legacy system and there were numerous efficiencies that could be gained from a more electronic process. For instance, after Go Live, SA stopped printing exam results and that saved \$20,000 immediately which showed some of the efficiency benefits that could be realised from replacing the legacy system, albeit after the fact.

Under the previous VC, the university had deliberately focused on teaching and research and tried to have as little administration as possible. The effect of this was to make the university very internally focused, as academic staff only had to take care of their teaching and research and were not expected to worry about anything else. However, there were steadily building external forces that could no longer be ignored by the university such as health, safety and labour legislation. Universities were also expected to compete for students and improve efficiency. These external pressures, coupled with internal pressures, such as the poor performance of the legacy system, meant there was a tsunami of change bearing down

on the university. Staff had been focused on teaching and research to ensure that students were well educated and there was very little awareness of how a contemporary institution was supposed to work because they had been so busy focusing on their own work for so many years.

So, people had very little awareness of how a contemporary institution had to work once there were a lot of legislative requirements to contend with which did not prove so successful. Once, the situation for competing for students became wholly more competitive than ever before. I think most people [did not understand this]. (Pre-implementation group member)

So, the focus on student services was emphasised as part of the pre-implementation work and put at the forefront during the implementation of the system. This was helped by the university's financial problems during this period as they were struggling to attract students from neighbouring institutions that were fiercely competing for students. This was a time when there were frequent, visible advertising campaigns by universities for students as a result of the government funding model for universities becoming numbers oriented. It also became readily apparent that other universities had more sophisticated home-grown systems or proprietary software that enabled them to offer online enrolment which SU could not. SU was slowly being left behind as one of the few major institutions that did not have this type of enrolment so there was a fear that they needed to do something to rectify the situation.

The legacy system did not meet student needs and was not functional for them because they had no access into the system. The pre-implementation group identified that it would be important for a new system to be able to allow students to enrol online and allow them to have access to all their own information and data. It was important that this was part of a single system so that SA staff could design a degree and have that available on the web for students to enrol in. Most importantly, the pre-implementation group identified enhancing the student experience as the primary goal for any new system. This emphasis was carried through into the implementation stage where the project's slogan was "Transforming the Student Experience." The project team therefore wanted to prioritise student needs and intended for this emphasis to continue after the project was completed. This meant that students had priority over other groups, including staff, which affected customisation. The project team had a very small budget for implementation and their aim was a 'plain vanilla'

implementation so that any additional customisations were targeted almost strictly for students with the aim of improving their experience first.

The staff have got to use it obviously. But I think the staff are here to serve the students. And that's the reason that we were less concerned, we were more concerned with delivering the student facing aspects of it. If we were constrained on budget, which we were, then providing all the functionality that the staff would have wanted would have been [too expensive], although we were concerned about the staff too obviously.
(Project manager)

The effect of this policy was that the staff interface for the system was largely untouched which meant poor usability for staff because the screens had more information than staff needed. Processes were also changed to meet student needs first at the expense of additional workload for academics. For instance, the workload checks described previously applied here too because this decision was made in favour of students and directly increased the work of colleges who wanted to implement such processes. There was also consultation with students to find out what they wanted in the system. The web group looked at the look and feel of what students wanted and there was a student survey conducted as well. Students were also involved in the usability testing for the system to make sure they were happy with how it worked.

In addition to the importance of meeting student needs, the SMS project also had to meet the needs of relevant legislation and to provide the reports needed for government funding. In addition to the focus on student numbers, government was also very concerned about the performance of each institution so SU regularly sent batches of data to the government which was a critical task for the university. Indeed, this was one of the risks of the legacy system in that if it did fail, then they would not have been able to send the necessary data and funding would have been compromised. The need to meet government requirements was also an issue in the selection of the system because they had to ensure that any system would be able to provide this information to the government. This tipped the scale towards local systems because they were able to guarantee compliance in the future which was more difficult for international systems to offer. Omega had already been providing systems for another New Zealand university and a range of polytechnics in New Zealand so they had a record of providing such compliance. If compliance changed, then the university would not have to pay for any new development as a result of changes in government legislation. For

the international systems, this was something they could not guarantee or something they could guarantee be done in a timely fashion.

If you pay for it we might change it kind of thing, which you cannot rely on. It's a hundred million of funding that's relying on a particular report being produced you gotta know that it's being produced. Not be told, yeah if you pay \$50,000 and we'll have it done in a year and a half's time. (IT project member)

This meant there was interest from the Ministry of Education (MOE) in the implementation because they needed to be sure that they would continue to get the data they needed from the university. They also had a keen interest in the success of the implementation because there had been a very recent Australian case of a failed SMS implementation at the Royal Melbourne Institute of Technology that had cost around \$40 million and which led to the project having to be restarted at great cost. So the MOE had a strong interest to ensure that SU was on the right path because any failure would reflect badly on those involved for having wasted public money. The selection of Omega proved to be important because there have been increasing demands from government for different data and reports which were managed easily with the SMS. There was very detailed reporting around EFTS, headcounts and all manner of financial statistics and information in Omega.

In addition to the importance of meeting student and government needs, there were a variety of other external forces that influenced the implementation. Once the pre-implementation process was underway, the team began looking at systems installed in other universities so they went to several New Zealand and Australian universities to examine their systems. They learned many things including being aware of how much functionality a system had because too little or too much could either not fit staff needs or make the system too complicated to use. There was also pressure across the configuration of the system to meet the vendor's requirements that the system be implemented in a certain way to ensure it ran without problems. For example, in the legacy system there were separate programs to handle professional specialisations in Engineering and Omega were influential in discontinuing this practice in favour of a more simple Engineering honours degree which could be split by subject options. Omega also had influence in the configuration because if changes could not be done in Omega, or they felt it should not be done, then they only had to mention the likely cost and time needed to add the feature to the system. This often put the University off because of the time and budget pressures they were under; this approach

therefore helped Omega's to manage scope creep and keep the project on track. Because there was limited documentation that went with the system, Omega had a lot of input into and control over the configuration, as they were the only ones who knew what different settings would mean.

Consequence

The system has improved the convenience for students as there is much less back and forth between academics and students now. Information is accessible and it makes it easy for students to identify what they need to enrol in. Students can enrol from home, pay for the course and see when their scheduled courses begin, all from anywhere in the country or the world. It is also much easier for them to find out their grades, change courses and interact with the university. An important factor of this convenience is the reliability of systems that have come with the SMS. The system needed to be reliable and secure so that it would protect student's data and be available whenever they wanted to use it. For instance, Omega has introduced a disaster recovery system which can keep the system going in the event of an emergency while protecting data. If the primary systems fail then there is an automatic cutover to the disaster recovery system and the system can just carry on as if nothing happened. There were no such systems as part of the legacy system and these sorts of changes have improved the customer experience to students from a system that is available for them to use. The focus on student needs meant that academics were left with a system that was much harder for them to accept. Staff already had a system they knew how to use and they had to move to a much less customised system that was not directly tailored to their needs. Thus, it was difficult for staff to accept a new environment where their needs did not have priority anymore and this was no doubt a factor in the resistance that occurred to the implementation of the SMS. So, although the system improved over the years since Go Live, there were still academics that did not use the system after their initial poor experiences with it and who developed new practices to avoid using it.

Academics do not like to use it. And so what they do is they just make decisions on pieces of paper and hand it to the administrators who then input the decisions. I think the reasons why they don't like it is because, from a usability perspective, it's not the friendliest of products to use. (Student administration member)

So, the university went from being very internally focused to going through an implementation which was very externally focused. The main thrust of the implementation

was to transform the student experience and make them the priority to help meet the changes from the external environment. This attitude lived on after the implementation with ongoing enhancements made on the basis of student needs first before other group's needs were considered. This was the mandate given to the SA team that administer Omega with the handover of the system. For instance, there have been plans for a new student advice module that would store advice given to students to provide a record both for the students and the academics of the advice given, to prevent future misunderstandings on either side. The university was also aware of what others thought about SU with SA staff reporting that they enjoyed the "envy of others" who did not have the form of electronic student records that Southern had. This helped make up for the ongoing costs of the system each year and the amount of money they needed to spend to keep making improvements for students and staff.

So, within this dimension there have been tensions between the need to satisfy internal versus external needs. In this implementation, this tension was most evident between the shift from meeting staff needs to student needs as a result of the implementation. This persisted after Go Live, which indicated that there was a shift in the cultural values of the university towards becoming more externally focused. This change in focus is evident in how decisions were made around changes to the system and how processes were also designed to meet student needs first over internal needs.

4.1.2 Other dimensions

Here, the remaining five dimensions from this case study are briefly outlined. These are dimensions where there were either minor struggles within the dialectic or little or no evidence of struggles. In these cases, this could indicate a balance between opposing forces or alignment between the values of the ES and the organisation.

4.1.2.1 Isolation versus collaboration

In this dimension, we examine whether there was evidence of the cultural values of isolation versus collaboration and what effect these values had on the implementation. In this dimension there was evidence of tensions between these values but these were not likely to lead to cultural change.

Changes from the recent restructuring meant that the university had lost some of its more informal collegial structures with more hierarchical, formal structures being put in place. For senior management the values that have become important are those around efficiency, effectiveness and performance. This may explain why there was increased internal competition within the university as units competed against each other for the same bucket of resources. There were divisions between academics and service units and within colleges between academic and college managers with little cooperation or coordination between each of them. Collegiality was still important to academics and for academic projects this often depended on the chemistry between collaborators. In service units, this was different as staff were more used to working in teams. However, service units felt there was a 'pecking order' at university which places academics before non-academic personnel. There was also a perception that academics were less likely to listen to ideas from service units. So there was a complicated environment within the university which affects collaboration between different units and unit types. The general culture was towards collegiality but recent changes had begun to tip the balance towards efficiency and effectiveness.

There were also tensions between isolation and collaboration on the project itself. This was first evident due to the lack of continuation between the pre-implementation and project teams with little information passed between them. Indeed, there was an attitude from the project team that they were separate phases of the project which explained why there was so little interaction between both groups. The project team was also perceived to have operated with little consultation with user groups despite this being flagged as an important issue in pre-implementation. Although, the pre-implementation group felt like they already had a good understanding of the relevant issues and so did little consultation with others. Some consulting was conducted in the initial stages but not repeated once they had drawn up the requirements for the system. The next period of consultation occurred after the decision was made to go with Omega and specific user groups needed to examine the system to determine what gaps existed with their own processes.

Across the project, there were also many times that team members worked alone on particular tasks they needed to complete. This is not to say that the project was run in isolation, as members enjoyed a fair bit of collegiality and group-work throughout the project. The project director ran a tight ship but the team still had time to have fun including team building activities, cake days and regular project meetings. Indeed, when members

worked in smaller groups on particular tasks, they often reported this was where they had the most fun. The relationship with Omega was also important because SU wanted a vendor who could provide good service. This influenced the decision to go with a local vendor because they felt they could enjoy a more collaborative relationship with them. Omega were also seen as the company that seemed to have the most eagerness to please potential customers and the system they proposed met SU's needs.

Consequence

So, the university was largely collegial although recent history suggested it had begun moving towards more isolationism. This was evident with the split between the project chartering group and the project implementation team where there was little cooperation between them. For example, many recommendations made by the chartering group were not taken on board by the project team who wanted to make their own decisions. Within the implementation, there was evidence of both dialectic values influencing the project and creating tensions. The project acted in a more isolated fashion to counteract the potential delays caused by becoming involved in too much consultation with departments as they did not have the time to do so. The result was that the system was poorly configured to meet staff needs; the time spent remedying these issues after Go Live might not have been needed if the system had been appropriately configured the first time. As such, the SMS may have moved the organisation away from collaboration, particularly as the SMS could provide more transparency and increase the competition that existed between units. Indeed, while one of the aims of the SMS had been to improve collegiality within the university, this was not achieved with the system creating greater divisions among units and staff more than before. Thus, it is not certain what cultural change has occurred as a result of the implementation.

4.1.2.2 Hard data versus personal experience

In this dimension we examine different cultural values for the dimension of hard data versus personal experience. However, although evidence was found for both of these values, there was no evidence of any conflict between them with both values being useful in assisting the implementation instead.

Across the project, hard data was very important which began with the documentation of requirements for the SMS in the pre-implementation stage. The pre-implementation team then used a function point analysis to rank each system based on price versus functionality

to shortlist systems for further investigation. There were also very systematic processes and data used to control the project team. When there were project meetings they would assess the project against the planned budget and time. Issues were recorded in an issue register and these were followed up as necessary. Important decisions and progress were often alerted with email. There was also a monthly newsletter and a website that people could access to view progress. This was intended to try and address some of the communication problems within the university. There were also various focus groups on usability and functionality where they would select end-users and work out how they were going to use a particular feature.

Personal experience was also evident across the implementation. In the pre-implementation group, this included members with systems experience and those without in order to provide some balance to proceedings. Requirements were sought from staff throughout the university who were working in the areas that would be most affected. Emails and surveys were also used to gather the opinions of those who might not have had the time to attend meetings that were held. This feedback then formed the basis for the requirements from which the RFP was developed. This process also lent a lot on the personal experience of the group as they drew on their own experience to help identify what the problems were. Personal experience was also used quite heavily around the selection of project staff. There was no systematic approach to selecting staff and it was more around talking with managers and identifying which staff would be suitable for the project and getting them involved. Project meetings were held frequently and members encouraged to share their ideas. Although, sometimes there were so many people in a meeting that it was often the most vocal that got to share how they felt. The project team were always eager to learn about problems and things that people did not like. So it was important to have more informal reporting of these sorts of issues to help understand how the project could be done better to fit to the requirements of certain groups.

Consequence

Focus groups were an important way of gaining information for the project, which was something that was generally not seen as much throughout the rest of the university. Although, academic managers only had limited involvement in these focus groups during the implementation despite the institutional knowledge that they had. Organisational experience was an important commodity and candidates with university experience had an advantage in gaining employment over candidates without such experience. So, in this

dimension there were both systematic attempts at data collection and more informal methods of gauging personal experience. These have both been useful in assisting the project whether it was from deliberate focus groups or someone having an informal conversation about an issue they had. As such, there is scant evidence of much tension as a result of the presence of these values in the project and no cultural change as a result.

4.1.2.3 External versus internal motivation

In this dimension we look for evidence of the cultural values of internal and external motivation to determine their impact on the project. For this dimension, there was no evidence of any conflict with these dimensions complementing each other for the benefit of the project.

At the university, there were some strong external motivators for staff. Staff were motivated by academic achievement, collegiality and monetary benefits. Academics in particular were motivated by the need to generate articles as they were judged by their research output and the contribution they make to their own fields. Collegiality was another important motivator as staff work with fellow academics in shared scholarship. The university also provided benefits to staff including extra parental leave, a superannuation scheme, health insurance scheme, subsidised study and use of campus facilities for free. There was also external motivation evident across the implementation as well. Pre-implementation staff received extra money back to their departments for the time they spent on the project. Staff who took on extra responsibilities were also paid more. Mostly though, the motivation lay around working with others and sharing the sense of achievement of being able to get the work done in the face of such tight deadlines. There was good team work on the project and there were activities to keep the project fun and develop team work amongst project staff. Finally, some staff were able to develop their long term career prospects from being involved on the project. Most notably the head of the SMS came out of the project team.

In terms of internal motivation, project staff got the benefit of being able to work with new technology on a project of major importance. The project was one of the largest at SU and involved a \$4 million budget and a mandate for change that would affect the whole campus. With the freedom on the project, staff could pretty much do what they wanted so they could up-skill themselves and use new technology they might not have otherwise used. Other staff had an academic interest in the project so that their involvement helped them witness some of the political, social and IS based changes that resulted. Indeed, the opportunity of being

able to work in a laid back environment with very little rules imposed from above was very motivating for many staff. Staff also believed in the project and it was very well run by an experienced project manager. So project staff felt valued and enjoyed being part of the project.

Consequence

On the project, the team building activities were key motivators for the camaraderie that existed on the team because there were no real financial incentives for staff. Instead, staff recognised the importance of the project while using it as an opportunity to develop skills that could enhance their career. Many project staff did not return to their old jobs and ended up in better positions as a result. Management also tried to support the team as much as possible by coming in, working late and bringing in pizzas and snacks to keep the team going when deadlines were rapidly approaching. So, there was a variety of motivators on the project but little evidence of dialectic conflict. Instead, the two orientations seemed to have complemented each other to the benefit of the project as this helped provide the impetus that staff needed to get in and complete the project.

4.1.2.4 Process versus results

In this dimension, we examine the cultural values of process versus results orientation to determine what impact that had on the implementation. So, although evidence was found for both dimensions, no conflict was evident and these values were complementary to the benefit of the implementation.

In the past, SU had a process mentality known as the 'Southern way' which stood for a code in which people knew each other, respected each other and got along with them. However, in the years leading up to the implementation, results became more important which was due to both external and internal pressures. Externally this was due to the introduction of regulations like Public Benefit Research Funding (PBRF's) which provided more funding to universities based on research output. These performance pressures bear down on people differently with the result being to increase the stress on many academic staff to improve research output. This has begun to change values from a focus on what is done and how work is done, to a culture valuing how much is done.

There were similar tensions across the project where a process approach was very important. The project began with the Green Book which outlined around 30 requirements

that the new SMS system should have. An organised process was also drawn up to narrow this down to a shortlist. The final report of the pre-implementation group outlined why they eliminated contenders, how the short list was derived and how they determined which vendor to recommend. Once Omega was selected as the preferred system, there needed to be a configuration assessment to determine the gaps that existed between the university's needs and Omega. A comprehensive plan was developed to work out how to move the university off the legacy system and into Omega which involved project team development, training, data migration and the configuration and customisation that needed to occur. This involved the use of proper methodologies to determine current and future processes and work out how these processes would change. To systematise configuration and customisation decisions, decision documents were used which outlined the proposed changes and noted the approval of relevant authorities.

There was also evidence of a results orientation throughout the project. In the selection phase, this was evident in the team drawing up lists of requirements that the system had to meet. On the project itself, they checked off tasks that were completed without ever really looking too hard at what was delivered. People were expected to meet project deadlines but there was little accountability of individual staff and what they had done. There was also a very tight schedule, so project management used critical path charts to keep people aware of when tasks needed to be completed and how they fit with the overall project. There were also immovable deadlines, such as new semester enrolment, that could not be missed. The project team also conducted trials with students before Go Live to determine that students could actually use the system to enrol which was a key deliverable of the project. So, there were strong efforts made to ensure that the project would be completed on time and budget, and meet the objectives that had been given.

Consequence

There were both results and process forces evident throughout the implementation and the result was that the system was delivered on time and on budget. The whole enrolment process was more streamlined and there was more functionality than before. Where the SMS was not so successful lay in meeting staff expectations of the system which was due to poor usability, changing to new processes and the extra workload now required. In terms of conflict, there was not much evidence of conflict and tensions across the project. The SMS project came on the back of very controversial restructuring that has had the effect of shifting the university away from collegiality towards more performance based values.

Within the SMS project this conflict was not as evident. Instead, these dialectic values seem to have worked in a complementary fashion that supported project implementation. For instance, on the implementation, specific tasks needed to be completed and this was supported by a results orientation which helped keep staff on track with deadlines. So, the consequence of these forces was complementarity towards the fulfilment of the project.

4.1.2.5 Short term versus long term

The final dimension examines evidence of the cultural values of short term versus long term and what effect these had on the implementation. For this dimension there was little evidence of any tensions between these values.

Throughout the implementation there was a focus on the short term which was necessary to get the project completed within its deadlines. The project had initially been an 18 month project but this was truncated to 12 months because of an earlier deadline due to the introduction of a continuous enrolment program. This provided the initial push to get people behind the project with project management keeping staff well informed of upcoming deadlines to make sure work was done as needed. Time pressures also meant tasks were done more quickly than in an ideal work. These meant decisions were quickly made without a lot of consultation of actual users. Time pressures also meant that the project team were largely constrained by what they could do which limited tasks like customisation. Sometimes, this meant that they needed to park certain issues until after Go Live because they could not resolve them now. This often included changes that particular groups of users wanted but which were not crucial for Go Live. This made management of user expectations important because people always wanted changes enabled now rather than having to wait for them. This left a long list of items that needed to be followed up after Go Live and almost a bare bones system delivered.

There was a long term focus evident as well. There was consideration given to future needs with the development of some of the systems and infrastructure that was put in place. For instance, some of the development work by IT sought to build this in a modular fashion which meant that it could be reused in the future. Also, the decision on which system to select, considered the ramifications of compliance with government legislation and how easily different systems would be able to meet such demands. This worked out well because the government introduced a steady stream of new requirements that had to be incorporated in the SMS.

Consequence

So, across the implementation there was evidence for both a short term and long term focus on the implementation. Although, the vast weight of evidence is in favour of a short term focus, which was no doubt due to the tight deadlines of the project. The consequence of this is that if more time had been available then the project team may have been able to sort out many of the issues that have caused such problems during and after Go Live. Notably this could have involved more consultation with staff and more efforts to improve the usability of the system. Although there was no guarantee this could have improved the implementation with parked issues sometimes being a mixed blessing because there was more time to attend to these properly after Go Live. In terms of the dialectic, although there is evidence for both forces, there is little evidence of any tension between them and no evidence of any enduring cultural change. So the consequence of this dimension is that there has been no cultural change as a result of the implementation.

4.1.3 Summary

So, in the SU case, three dimensions were found where there was strong evidence of tensions that affected the project and where it is likely that cultural change occurred.

The first dimension, was stability versus change. The university had been run in a settled fashion for many years and staff were unprepared for change. When the pre-implementation group began looking at a new SMS, the process took 3 years as they struggled to work out what was needed and make decisions. There was also a lack of engagement from staff as they were used to others making decisions for them. Indeed, staff wanted to retain how their work was currently done and did not want to learn different ways of working. The result was that groups resisted the system because the interface was not customised to the needs of staff while IT preferred the benefits of the status quo. However, the experience of staff going through this change has resulted in the university becoming more change oriented as staff were now more prepared for change. Evidence of this was seen with staff making suggestions for new changes and being actively involved in new initiatives such as the student advice module.

The second dimension was concentration versus autonomy. The university was grounded within the values of academic freedom while there was no centralised power to push the

university in a single direction. Units and individuals largely did as they pleased and there was little exercise of control over them. This affected the project because there were major shifts in responsibilities for units such as IT and SA, leading to conflict and the slowing down of the project as various top managers were brought in to resolve each dispute. The system also introduced standardised processes that have replaced the customised and individualised processes of staff and units. Within the system everyone is treated equally and there was no more consideration of the 'specialness' of individual units. The result was that the university has become more concentrated as critical responsibilities have become centralised and important processes standardised across the university.

The last dimension was internal versus external focus. The university was very internally focused as a result of past policies where staff focused on teaching and research. There was little consideration of the external environment in regards to competition for students and the growing compliance requirements from government. The project recognised the need for change and set the key goal of the project at improving the student experience. On the project this meant customisations were made to enhance the student experience first with little work done to improve staff usability of the system. Processes were also changed to make things more convenient for students even if this increased workload for staff. This attitude has continued after the implementation with process and system enhancements prioritised to students first. This created tensions between internal versus external needs across the project and resulted in a shift of the university towards becoming more externally focused as students were more important than before.

4.2 Case Study 2 – SAHB's Implementation of ResultSys

This case study examines the first phase of the implementation of ResultSys at the Southern Area Health Board (SAHB) which was to import test results from the three main Southern community laboratories into a single database. ResultSys was a branded service made up of a number of systems, processes, policies and tools to provide clinical results to the health community. These results were publicly funded results from within the secondary and primary care sectors and the system worked by storing and providing access to these results. For instance, when a patient walked into a hospital emergency room they also entered into a health contract provisioned by that hospital. While at the hospital, the patient may have a number of tests done, such as the taking of blood etc., which were used to formulate a healthcare plan for the patient. Before ResultSys, these results would only be available

within the hospital, but ResultSys made such results available to all doctors looking after that patient, whether they were in the hospital or in an outside practice. Alongside the technical elements of ResultSys, there was the privacy model which has the communication materials, policy and processes that were applied to protect patient privacy. Privacy was an important issue and patients were able to select which test results were shared, or not shared, at the time they took the test.

There were several drivers behind ResultSys. The main driver was that hospital clinicians felt that they could offer a much higher level of care for patients if they had access to community lab results that had been conducted prior to their entry to hospital. For instance, patients entering emergency rooms might end up having tests redone in order for a diagnosis to be made. If prior results were readily available then clinicians could have moved forward with diagnosis and treatment much faster. The patient would not have had to endure repeated tests and the SAHB could save money from not repeating tests. So, the project had the benefit of improving patient care while also offering improved efficiency which could save the SAHB money in the long term.

There was also an external driver towards a system which could centralise data into a repository. This fell within the National Health IT plan which promoted the idea of regionalised clinical data repositories throughout New Zealand. Further, groups such as the national clinical IT leaders committee had also realised that it was better for clinicians to drive the changes they want rather than to impose change on them. Thus, there was more willingness to support clinicians drive for systems such as ResultSys which also helped get this project off the ground.

The initial planning for a centralised repository began as early as 2002 but it had never gained much traction as it endured a number of false starts. This was due to the SAHB lacking the technical infrastructure to support ResultSys. Thus a lot of the work in these early stages was around prioritising activities and investment to support the future implementation of ResultSys. In early 2007 there was increased pressure to move forward with the project from a series of meetings with Haematology, the Planning and Funding department and the Project's Director. The planning and funding department were eager to learn of progress so far while the Head of Haematology was also pushing for the project to move forward more quickly on the basis of clinical concerns. The Head of Haematology was

such an advocate for the project that she would become the clinical project sponsor and champion for the project.

The outcome of these meetings was the birth of the comparability project, involving standardising the ranges and intervals of different analytes (i.e. substances or chemicals that are of interest in testing procedures), that was needed to support any future technical implementation. ResultSys involved the consolidation of test results from different providers into a central data repository. As such, it was important that there was a standardisation of the measurements used within those results. It was also important that results could be comparable for cases where clinicians wanted to examine a patient's history and past results. For that to work, there had to be standards agreed upon for naming, measurement and range conventions. Logical observation identifiers names and codes (LOINC) were used for this purpose as they were globally used although these codes did not say what the reference intervals were so this was something that still had to be worked out. The comparability project would bring together the three major, competing community laboratories to work together with the SAHB's IT department to standardise the different measurements used in each organisation. The laboratories were contractually bound to provide copies of test results to the SAHB to protect contracts worth millions of dollars per year. As such, they were very eager to go ahead with this part of the project, although they did not want to provide any resources towards the actual management of the project which was instead undertaken by the SAHB's IT department.

The technical implementation followed the comparability work but was initially plagued by a lack of leadership as no project manager was appointed. This created a lot of frustration towards the lack of leadership of the project and it took extended pressure from the Chief Medical Officer (CMO) and high ranking clinicians, before a project manager was appointed. Once the project manager was appointed, he went through a process of discovery to work out what had been done, who was involved and what was needed. The project discovery helped identify Northern as a collaboration partner for the SAHB. Certainly there were some compelling benefits for collaboration to both sides. The SAHB could take advantage of the work Northern had done to get their system implemented, while Northern could benefit from a partner to share costs, while progressing a system that could become the standard repository used across New Zealand. So, a group from the SAHB went up to Northern and after several meetings they agreed to work together. The collaboration would involve

sharing resources between the two groups, such as websites and call centres, while the SAHB could take in full the privacy and ethical work undertaken by Northern that guaranteed compliance under existing privacy legislation. They would also receive all the documentation from the Northern implementation and have access to their project team. In essence, this would allow the SAHB to move forward much more quickly than might have been possible from working alone.

The implementation stage then involved both the comparability and technical projects which were carried out at different times. The comparability work began in early 2007 while the technical project did not start until July, 2009. The content of these implementations is examined further in the next section where pertinent events are examined to assess cultural tensions and struggles that occurred throughout the implementation.

4.2.1 Analysis of dimensions

The implementation of ResultSys at the SAHB is further examined in this section in conjunction with two dialectics which were seen to create struggles throughout the implementation. These dialectics provide evidence for differences between cultural values of the organisation and the ES being implemented and are examined in this section. The results of this case study are summarised in Table 4.2:

Table 4.2 - Key cultural dimensions from SAHB case study

Contradiction (Cultural Dimension)	Identity	Struggle(s)	Consequence
Concentration vs. Autonomy (Control, Coordination and Responsibility)	Different organisational groups had their own autonomy and central authorities did not have the power to directly force them to complete work when needed.	<p>1) Laboratories and GPs had their own ways of working and it was difficult to push new changes.</p> <p>2) Clinicians were responsible for their patients and would oppose anything that might increase clinical risk.</p> <p>3) Staff were not directly accountable to the project team and would prioritise operational work over project work.</p>	Tensions with autonomous groups meant centralised efforts were needed to facilitate participation and change. These tensions created disputes between different groups that delayed the project and resulted in higher costs being incurred.
Process vs. Results (Orientation to work)	The SAHB had a strong process culture based on the training and methods that clinicians were grounded in.	Clinicians pressed for a rapid implementation while IT were trying to follow the necessary steps to complete work properly.	Clinicians wanted results and IT wanted to follow the process which caused frustration despite both groups sharing process orientations. Otherwise, the process culture of the SAHB smoothed the implementation.

4.2.1.1 Concentration versus autonomy

In this dimension, concentration versus autonomy is examined. Both of these orientations were evident within the ResultSys implementation with tensions being the result. These were around the centralisation and standardisation of data, clinician autonomy and the matrix-style project teams used at the SAHB.

Centralisation and standardisation of data

ResultSys involves the creation of a centralised repository of clinical results for Southern which brings together results held in organisational units so that everyone who needs to can access results. Regionalisation initiatives have also impacted on the ResultSys project because of the need to be able to link up different AHB's with each other so that data can be shared. Thus, the centralisation of data in ResultSys was the first stage of the centralisation of data across the country as well. To make this centralisation of data happen, there had to be a process whereby all data going into the system was standardised into an agreed upon format and set of measures so that results could be compared. This meant that testing laboratories had to change from using their own processes for conducting results to using a shared set of standards and measures that would be used by all. This standard was the Logical Observation Identifiers Names and Codes (LOINC) which standardised terms for all kinds of observations and measurements to enable the exchange and aggregation of data. The project team then went through each LOINC code to agree on naming conventions, measures and ranges to arrive upon a common set of standards. These were then shared with other local bodies to help arrive at a national standard that could provide the base for future regionalisation efforts as well. Once agreement was made, each laboratory then had to change their systems to align with these new standards. The project team also tested each laboratory to determine comparability across laboratories. This process took around 6-8 months to complete and much of the problem lay with getting laboratories to correct their systems and send in results in the agreed upon formats.

So, the ResultSys project involved centralisation of data, and standardisation of practice for each laboratory. The dialectic conflict lay with the decentralised nature of those involved and how it conflicted with the centralisation that occurred. The GPs who needed to authorise their patient data to be included in ResultSys were autonomous to the SAHB,

likewise, the laboratories who needed to take part in the standardisation of measures were also autonomous although they were bound to some extent to comply against the stipulations within the SAHB's contract with them. Both of these groups are examined next.

GPs needed to explicitly provide permission for ResultSys to collect their patient data within the centralised repository. Each practice was a private business which had to be treated individually and managed. The SAHB had no power to force GPs to do what they wanted so they had to engage in a very open process to convince them to sign up and agree to allow their data to flow into the system. In contrast, GPs had a duty of care to their own patients, so they had to be sure that allowing patient data to be part of ResultSys would be in the best interests of their patients. Privacy was one of the primary concerns to them to ensure this would be protected for patients. They also needed to know that the patient could opt out of sharing results if they wanted to. Despite these concerns, the project team were successful in securing the permission of almost every practice to provide results, with those who had not being laggards rather than refusing due to concerns with the system. However, the project team did run into problems with several external referrers of results, that did not want their results coming into ResultSys en masse. One example of this was family planning where they were concerned about patient privacy regarding women who had done pregnancy tests. Family planning considered all these tests as being sensitive so they did not want them included in ResultSys. However, with the involvement of the CMO the project team managed to convince Family planning to keep sending their results in because patients always had the individual right to opt out of sharing their results in ResultSys.

The laboratories also retained a lot of autonomy throughout the standardisation work despite the need to comply with the contract. Under the contract, the laboratories were committed to taking part in the creation of a centralised repository so they were happy to help with that. However the contract did not specify exactly how or when they had to participate so it was difficult to exert direct control over the labs to enforce participation on a schedule that was conducive to the project. This slowed down the project as the project team had little power to force labs to get work done in line with project goals and timelines. Laboratories could also throw up roadblocks when they did not agree with the processes being used. One example involved a director over-sighting a lab who believed that another lab provider was not adhering to proper clinical practice. As such, the lab refused to provide results to ResultSys and it took a long process, involving groups of clinicians, to convince the

director to overturn their decision. This delayed the project unnecessarily for 3 months while costing time and resources of staff.

The [person] over-sighting that with the lab thought, or believed, that the other lab provider ... was not [adhering] to proper clinical practice. We could see that that was not the case. That data was data. Ok? [But] it stopped our ability to complete our testing, [and] copy[ing] results through for over three months. As we worked through that process of satisfying this clinical [re]view and requirement. Ok? ... And at the end of the day, when push came to shove, after several governance meetings and debates, and such like. ... he just flagged it.. (Project manager)

This was an example of a case where the autonomy of the laboratory held up the progress of the project team and this was difficult to resolve as they were not under the direct authority of the SAHB. These cases happened often and served to delay the project when they occurred.

Clinician autonomy

The autonomy of clinicians created an enduring tension across the project, particularly in their dealings with IT. Clinicians were known to be very intelligent, clever, opinionated and not very tolerant of those holding views outside their own. As such, they tended to disagree with each other and members of IT on a regular basis.

And, they (clinicians) do not agree with each other a lot of the times. The general surgeon will look at an orthopaedic surgeon and say 'that it is a carpenter with more tools,' in fact the carpenter has more tools, so there is a lot of that going on. And we have to navigate through that and that takes a lot of effort and a lot of time. (IT project member)

This created a very pertinent management problem as clinicians had to be kept on track as much as possible to prevent delays. Different groups had different personalities, viewpoints and objectives while the SAHB was also an amalgam of a number of organisations and each of those had their own IT strategies and systems in place as well. Further, different clinical specialties all had individual needs as well, for instance Haematology needed test results while surgeons generally did not. As such, the complexities of managing all these different units was an essential part of ResultSys to ensure everyone was pulling towards meeting the

goals of the system. To counteract this autonomy, the project relied on a centralised, collegial approach to keep clinicians on side. As such, there were a lot of collegial and collaborative decision making sessions that enabled clinicians to express their autonomy but also engage in decisions to suit everybody's needs. This reduced some of the problems of clinicians holding counter views to the project team, and also provided a medium for resolving such disputes when they occurred.

Centralised decision making was also important because the CMO did not have direct power over clinicians at the hospital. The CMO was the most senior clinician at the SAHB and while he would have authority and mandate over other clinicians, he generally did not enforce this to attain compliance. Instead, decisions were made in a collegial process, as used on the project, where everybody could work out what was the best course of action.

Well, they sort of, it's a hard one for me to answer actually. They are pretty much required to. He (CMO) does have the stick. And he does have the authority and mandate. But understanding how clinicians work and behave, they sit and they talk ethically, they talk about the correct process and they are very collegially-based.
(Project manager)

So, the CMO was not an autocratic role but rather a guiding influence on other clinicians. The CMO would not direct a clinician to do something; rather he would frame it as a request and his power would be exerted through meetings with other clinicians throughout the organisation. Thus, a more centralised, collegial-based approach was used to solicit agreement from clinicians on the best processes during the project. During the project one of those groups was the clinical information systems group (CIS group) which met monthly about general IS issues and where reports on ResultSys were also given. There were also more ad hoc groups set up to be involved with ResultSys as well. For instance, the clinicians who originally drove the project, were still involved and would receive updates from the PM and the opportunity to provide feedback at regular intervals. These different groups provided a collegial approach that could be used to foster common agreement when there were problems with clinicians with differing views. This approach has also helped clinicians take ownership of their decision making and to get them to commit to their decisions so that the project team could go and implement the necessary solution.

Matrix style project teams

The SAHB's IT department utilised a set of project managers who would generally be involved with a large portfolio of projects between them. PM's tended to be oversubscribed on other projects and there were problems assigning priority to projects to work out who needed to be where. For ResultSys, it took a long time to identify a PM that could take on the technical implementation, and who had the organisational *nous* to succeed. The slowness of this process caused a lot of frustration with the clinicians driving the project although their pressure eventually helped a PM to be assigned. Within projects, each PM would then draw resources from different areas of IT such as infrastructure, business requirements and user support and training as well as involve other areas of the SAHB as required. The project team would then be responsible for coordinating and conducting the project in line with project goals. Although, project staff were not assigned fulltime and would still have their regular day jobs to attend to. Further, the operational demands of staff were typically given preference over project work.

This created a dialectic tension between the necessary centralisation of staff to work on the project versus the autonomy of staff and pressures on them to fulfil operational requirements. This was due to project staff not being under the direct control of the PM. As such, the PM could ask project staff to do something, but if they did not do it then there was no mechanism to force them to do it 'bar nagging them' or trying to get their supervisors involved. Thus, there was always a process of negotiation involved with the PM trying to get the work done for the project such that relationships with these autonomous staff became very important.

*And also in health we do not have the ability to demand things to be done. If you're on my project team, then I cannot come up to you and say, "Jim, you have not done that, why is not done, look there is consequences if you are not doing that [you will be reprimanded]". Its more along the lines of: "Jim mate, how is it going? Busy? Yeah, ... I really got to get this stuff done, can you fit it in tomorrow?" It's that kind of scenario. Different to the old private sector; it's all done by influence and how matey you are.
(Project member)*

Negotiation and personal relationships were necessary to create some leverage over autonomous staff in order to keep the project moving. Indeed, most of the project work

tended to be in bursts as the PM assigned someone to get something done and then had to wait for them to finish before the next phase could begin. Further, the PM's felt that if they were too pushy with project staff, then the project would not have been as amicable as it was and this would have compromised the relationship they needed with staff to get work done. Also, trying to force staff to complete work was simply not an option when IT were dealing with clinicians, because IT staff simply did not have the authority to do so when patient care was always the first priority.

The PM would also have a lot of autonomy to direct the project as he saw fit and to spend the project resources as was considered necessary. However, if help was needed from other departments, the PM had no right to make demands of them and he would have to frame it as requests for assistance with the expectation that such assistance would be granted. For instance, the Planning and Funding unit held the contracts with the laboratories so he had to establish relationships with them in order to use them to leverage the laboratories to do what was required.

I've had delegation authority and mandate. And I had the governance model in terms of my Chief Medical officer and our funding arm, because these are SAHB funded results, so Planning and Funding are in those contracts so therefore they own the relationship. All of those, I had to establish those relationships, as part of the project. And, exercise my mandate through them. (Project manager)

In cases where units were not cooperative, the PM could leverage the CIS group or the CMO to encourage cooperation as needed. If there were problems with securing resources from other areas of IT, the PM would keep the CIO updated and the CIO could arbitrate on such problems when they occurred. Often, because project teams were so busy, and resources so light, it was sometimes the case of whoever screamed loudest being the ones able to secure the resources needed to progress their project.

Consequence

The consequence of these struggles was that ResultSys only began moving forward when there was a centralised effort to progress the project. It took the sponsorship of the CMO and IT, and pressure from senior clinicians, to make the project a priority and secure the resources needed. One of the dialectic tensions was centralisation-autonomy pressures involving the external laboratories who were key to the standardisation that ResultSys

required. The autonomy of such labs, meant they could disrupt the project easily whether they had reason to or not, which cost the project time and money wasted as they had to wait to resolve each objection that occurred. For instance, in the case of the clinical director opposing input of results into ResultSys, this was guesstimated to have cost the project in excess of \$150,000 and the loss of staff operational time and that of senior clinicians having to be involved in discussions to resolve it. The project team did not have the authority over clinicians to challenge them on clinical grounds so when these objections were made, there was a long process used to overcome them.

And it's not our role to challenge them clinically, He's saying 'clinically unsafe,' we're saying 'tell us why?' He's saying this is the reason why. And we're not qualified to say that reason is invalid, we have to navigate our way through it and get other clinicians to tell him or debate it. (Project manager)

Instead IT have had to learn to understand the world of clinicians better, and this was a major learning point for IT from the project for those IT staff who worked on it. Project staff told of having a much better understanding of the clinician's viewpoint which has helped their own understanding of what it means to provide effective clinical IT.

Tensions were also evident with the autonomy of laboratories. It took a long time to get them to make the necessary changes in line with what was agreed from the standardisation. They were just too busy and the SAHB had no real authority over them to get work done. This resulted in a very stop and start project as the project team had to wait for these changes to be made each time. Then they needed to validate data and ensure that the necessary changes had been made. So it took months to check, double check and even triple check the output from labs, in an iterative process, to ensure the necessary changes had been made.

Finally, the matrix style teams meant that it was hard for the project team to be able to meet necessary deadlines with the effect that the project dragged on much longer than it should have. Project staff noted that if they had been able to work on ResultSys with no operational pressures then they could have completed the project a lot faster. Instead, the pressures of operations and the lack of the PM to be able to demand things be done has meant things were delayed. This was also the case with PM's trying to get work done by clinicians. For instance, during the standardisation phase after each meeting, they would

update the necessary documents and send them to clinicians for ratification where they could sit on someone's desk for two months until they found the time to do it. The PM could not just tell them to get it done, instead it was their use of relationships and encouragement to push people along to complete tasks.

So, across the ResultSys project there have been issues between the need to centralise data, processes, clinicians and staff and the autonomy of those elements that resisted the imposition of direct control over them. These tensions caused disputes between different groups which delayed the project and resulted in higher costs. In terms of cultural change, there has perhaps been a shift towards more centralisation within the SAHB as clinicians now use a standardised, repository of data which they all share. This may also be the case with external laboratories that have ceded some of their authority over test results to the standardisation that occurred and the Southern Quality Assurance Group (SQAG) group used to maintain those results. Although, the predominance of evidence presented here suggests that the status quo has been maintained, and that these tensions have cancelled each other out to create a situation where there has been no real cultural change within this dimension.

4.2.1.2 Process versus results

This dimension considers the extent to which the organisation has either a results or process orientation. In general the SAHB has a process orientation which was shared by both IT and clinicians with tensions arising due to the results orientation of the project.

The SAHB was a large bureaucracy with forms for reporting all kinds of different things. There were also groups' setup for all kinds of different purposes for managing important processes at the SAHB. Clinicians too had a strong process orientation because they were trained that way, to follow the correct procedures when treating patients. On the project, the process orientation of clinicians helped the project because people understood the need for processes so tasks like the standardisation work went much smoother than otherwise. It was important to have a PM with a clinical background to manage this part of the project which revolved around the setup of standards and processes for ResultSys. It was essential that the project was done properly otherwise external groups would have resisted participation if they thought there was the possibility of clinical risk. This was the case with the Northern rollout where some very notable groups refused to participate because they thought that the project had not been done properly. Thus, it was important to have adequate testing procedures in place to ensure the validity of data in ResultSys. This was

also evident in the privacy work which had to go through a number of stages to ensure that what they were doing would meet government privacy legislation. This required external legal and clinical reviews to show that there was a very rigorous process applied to ensure they aligned with this legislation.

The IT department also shared this process orientation but were often asked to be more results oriented, especially in projects that had to be conducted quickly and there was no time for the usual procedures to be conducted. One example of this was during the flu pandemic when it was important to produce an application that could be used to track patients. Due to the results orientation, a lot of tweaking and adjustments were needed along the way to get the project completed, but had they gone through a more systematic process of gathering requirements and talking to stakeholders then they might never have finished it. There has also been an increased desire at the senior management level to become more results oriented as there can be positive outcomes when the existing bureaucracy could be avoided. However, this also led to further costs as sometimes processes skipped, were actually necessary, and could cost time as they needed to be returned to and completed later. This was evident on the ResultSys project which is examined next.

On the project, there was a strong results orientation initially as the clinical departments drove the need for a results system but were not too bothered how it was done. This quest for results meant many of the necessary processes that were needed to get the project underway were skipped. Thus, when the PM joined the project, sometime after it had started, he found that there was no business case and therefore no capital budget to support the project. The initial drive helped get the project going but ended up slowing the project down because necessary steps were missed that had to be revisited. This lack of planning also extended to objectives and scope which had also not been defined. The PM needed to develop the project plan and strategy as well as the communications plan and privacy policy that were needed before execution. ResultSys was also a very complex project and required the setup of many different activities that were interlinked. For instance, there was enterprise storage that had to be setup for ResultSys that was needed for other projects as well. Thus there has been procurement, contractual and implementation processes to sort out the data centre too. So there were many examples like this where the need to follow the correct process was needed for the benefit of ResultSys and the implementation.

IT had their own processes for the setup of software and hardware. However, IT were often conflicted between the need to produce results for others, and the need to satisfy their own process orientation to finish work properly the first time.

The desire for IT to follow their own processes, versus the pressure from others within the organisation to produce results created a tension on the project. Clinicians were pressing for a rapid implementation of a solution whereas IT were trying to go through the necessary procedures to do it properly. As a result there was tension between clinicians and IT which could be summed up in this quote from an IT member about the difference in orientations between both groups.

I think it's more about the result usually. They (clinicians) do not care how we (IT) do as long as we get it done. It's a wee bit difficult, we sort of clash a little bit on that one because our jobs are about the whole process and making sure that it works. Whereas, yes the business itself just wants the end result. (IT project member)

Clinicians generally did not appreciate what IT did and just wanted the project done as quickly as possible. Even though both groups had a process orientation there was still a lack of understanding between each about how the project would be delivered. Clinicians did not seem to appreciate the processes that IT needed to go through to actually deliver results.

I suppose even in things like when we have to provision a route for a data flow coming in from an external source. There is quite a number of steps we have to go through to do that. And, I think there's a perception sometimes that what you do is put in the CD and type setup and it happens. Where in point of fact, there's a lot of methods, a lot of analysis that has to be done and a lot of configuration work must be done and after that a lot of testing. (IT Project member)

This included the need to use a lot of methods and analysis to determine what the problem was, what the requirements were and what solution was best to fit the problem. Then the solution had to be implemented, people trained and the system tested to ensure it worked as needed. So there was quite a process that IT typically had to go through to deliver results to the organisation. Possibly the differences in understanding between clinicians and IT were due to problems with communication. It may have been that when IT discussed the project they made it seem that it would be easy to do. So that clinicians got the wrong idea of how

difficult some parts of the project were or the need for extra work like testing and debugging that might slow down productive use of the application after Go Live. This lack of understanding and communication worked in both directions with IT also struggling to understand what clinicians wanted too. IT have had to build relationships with clinicians in order to be able to understand their clinical requirements and translate those into IT requirements. This was a real challenge for ResultSys because both groups are in different worlds due to their understanding of what is required. IT will consider all the technical hurdles that must be overcome whereas clinicians just want to see a result. So there were differences between both groups that have created some real tensions across the project as both groups struggle to understand each other despite sharing a similar process orientation.

Consequence

The result of tensions between IT and clinicians, and the lack of understanding and appreciation of how the other side works, has no doubt led to some of the delays that ResultSys experienced. There was at least a six month delay from the expected completion date of phase 1 to the time when all the major issues were complete which suggested there were significant delays across the implementation. There was speculation from some project members that this happened because there can be a lack of accountability on projects that are just allowed to run and run. There was no one asking the hard questions of why the project was taking so long and this was not an uncommon situation at the SAHB.

No, sometimes I do not think there is much accountability on when a project is going to start or it can drag on for ages and often there isn't anyone asking the hard questions of why it's taking so long. Definitely seen that quite a few times. (Project member)

This suggests that more of a results orientation would be beneficial to the organisation. Senior management had begun to realise that by skipping some processes the project could be implemented more quickly. However, some processes could not be skipped and would only delay the project because of the need to return and complete them later on. The process orientation of IT tended to frustrate clinicians and IT alike. There was frustration from clinicians that things were not proceeding as quickly as they should whereas IT were frustrated because they felt that clinicians were not hearing some of the difficulties they were having with the project. Indeed, the IT department were seen to be moving very slowly as they needed to complete their own procedural steps on the project. To even get new servers installed, a project has to be raised with the capital expenditure committee, then

debated in another committee and then if approved an external contractor could not be used so you had to wait for hospital staff to be available to install it.

So, the struggle within this dimension was between two subcultures within the SAHB which share the same orientation, but which still have problems communicating and working together. In general, ResultSys required the support of a process orientation because of the need to work through all the standardisation, comparability and privacy work that were needed to support the project. The process orientation of the organisation thus helped to enable this project and make it run more smoothly than otherwise. However, the subcultural differences between IT and clinicians created tensions that had notable impacts on the implementation.

4.2.2 Other dimensions

Here, the remaining six dimensions from this case study are briefly outlined. These are dimensions where there were either minor struggles within the dialectic or little or no evidence of struggles. In these cases, this could indicate a balance between opposing forces or alignment between the values of the ES and the organisation.

4.2.2.1 Stability versus change

Here we present evidence of the cultural dimension of stability versus change to assess the impact these values had on the implementation. However, while there were some tensions evident these did not result in any cultural change.

The SAHB could be characterised as an organisation that was stability oriented with a general unwillingness for change. There was a lot of frustration within the organisation because there was too much bureaucracy with decisions being slow to make and the organisation slow to change as a result. There were two important groups in the implementation; clinicians and IT staff. IT were resistant to new ideas while clinicians were equally resistant but also willing to change if there were clinical advantages to be realised. This 'slowness of change' explains why ResultSys took so long to get going from its launch in 2002. There were many different units involved and they all had to be motivated and work this change through their slow processes. Once launched, clinicians had mixed reactions to the system with many thinking that their existing medical systems would be replaced which they were opposed to. It was necessary for the project team to explain that this was not the

case and that ResultSys would supplement what they already used. Thus, communication has been important in working through these tensions between stability and change with clinicians.

GPs would also need to change their processes to use the new system. In Phase One, this involved them agreeing to share results with ResultSys. In Phase Two, results could be accessed by GPs and this was where there could be resistance as GPs learned how to do this. GPs were similar to hospital clinicians in that they were unwilling to change unless they could see the advantages of the change. Change management for these users was also more demanding because they were dispersed in private practices throughout the Southern region. Thus, the dilemma has been between creating an easy application that GPs could use and then dealing with how to roll this out to them. The Northern experience has informed some of these decisions as they found that GPs were unlikely to use the system if they had to login to a separate area of their practice management systems (PMS) to view results. This meant that the SAHB tried to create a seamless method to make it as easy as possible to view the system. The advantages of ResultSys could then be better 'sold' to GPs in that the system would be easy to use and also prevent some of the inefficiencies inherent with the existing system. For instance, without ResultSys, if a GP wanted to access results for a new patient, they would have to go through a lengthy process of contacting the relevant lab providers and getting access to those results by fax. With ResultSys, they would have immediate access to those results which would improve the GP's ability to provide care to their patients.

Consequence

So, both clinicians and GPs were somewhat change resistant towards ResultSys. This has meant the project has tried to minimise the change needed for these groups and to put the system in the background as much as possible. ResultSys has been slowly rolled out to clinicians so they can become accustomed to using it rather than through a 'big bang' approach. The project team also tried to get clinicians more involved with decision making in the project than in the past. This gives them the opportunity to provide their input rather than just complaining about the final outcome they were forced to use. These sorts of new processes could then be used to help staff cope better with change because they understood the need for change better and they became more involved with what was going on.

In terms of the dialectic, there was evidence for both orientations across the implementation with some tensions as a result. However, of the change resistance that has occurred, this has often been met by bending things as much as possible to reduce the change that otherwise would have resulted. So, the effect of this has been to reinforce the existing stability orientation within the SAHB as people were not forced to change. Possibly, once phase two kicks in, GPs will be more exposed to change and greater resistance may be evident. The strategy so far though, has been to placate those affected by change, especially GPs, to ensure that the SAHB can maintain their credibility. So, when they may need to bring in more sweeping and important changes than ResultSys then GPs will have confidence that they can deliver.

4.2.2.2 Isolation versus collaboration

In this dimension we examine the cultural values of isolation versus collaboration to assess the impact of these on the implementation. The SAHB has a collaborative culture which matches that of clinicians and although there was evidence of isolationism as well, there were no tensions as a result.

The project team was run in a very isolated fashion with team members working alone and having little interaction with others. This has not been helped with team members often located in different buildings at the SAHB and around the Southern area. This made communication and collaboration more difficult to achieve as project members were not only working alone, but were physically separated from each other as well. The other major party involved in the implementation was the external testing laboratories. They needed to help with the standardisation of measures and then implement those changes on their own equipment. They were contractually required to do this but did not want to do anything more. Their attitude was that once test results were sent to ResultSys that the SAHB would need to verify those results themselves. The project team had to work with each lab to convince them to take a more pragmatic view because the success of the system would involve the cooperation of both parties to verify those results.

In contrast, collaboration was more important to the project, although this did not result in any tensions or conflict. Perhaps this was due to clinicians being part of a collaborative culture, where people could work together while valuing each other's ideas and autonomy. This was evident during the comparative project where clinicians from the SAHB and laboratories were able to go through each measure and gain agreement reasonably quickly.

On the project, it was also important for the PM to be able to leverage a number of different departments to be able to achieve the goals of ResultSys. This too, was relatively unproblematic with people willing to work with each other and help the project. The other major area of collaboration was with Northern as the SAHB were able to forge an agreement with them that allowed them to take a lot of the privacy regulations, databases, schemas and applications that were developed and review them for use at Southern. This has been helped by peer to peer relationships that have developed between these two AHB's through sharing experiences and working together to solve common problems.

Consequence

The collaborative culture at the SAHB has been a strong enabler of the ResultSys project. In the beginning, this helped to secure the agreement with Northern to collaborate on ResultSys which has resulted in the SAHB implementing ResultSys much quicker than Northern were able to do. Although, there has been some concern that the SAHB needs to be rigorously checking to make sure that what they were taking would fit their own unique structure. The need to bring clinicians together and agree on common standards also meant this work took longer than planned but was necessary as this could not be achieved without such collaboration. Thus, the presence of these two values has helped enable and support the implementation of ResultSys at the SAHB.

4.2.2.3 Hard data versus personal experience

This dimension examines the cultural values of hard data versus personal experience to determine their impact on the implementation. On the ResultSys project, both orientations were evident but there was no conflict between them.

The SAHB was a bureaucratic organisation where there was not a lot of transparency into what different units and roles did. As such, personal experience was important in identifying people who could help. As such, long tenures were valuable for staff because staff often knew the right people to contact within the organisation for certain things and would have a relationship with them. On the project, this was valuable because the PM could use his experience to identify staff that were needed. Experience also helped the PM realise the possibility of collaboration with Northern from conversations with his personal network. The PM knew a variety of different people, be they clinicians, GPs, lab providers or vendors, and talked to them about the project to gain their feedback on it. The PM was able to discuss challenges with his counterparts at Northern and use the lessons learned from their

implementation to improve that of the SAHB. These personal networks were also invaluable for dealing with clinicians, who were often unwilling to hear things from those who were not clinicians themselves. Personal experience was also used to determine that the access method for GPs would need to be changed. The project team continued to solicit peoples' experience and opinions into the project to provide feedback on what they were doing or to provide insights into issues they had not considered.

Almost working in conjunction with personal experience has been the importance of hard data to many at the SAHB. The integrity of the results data was of upmost concern to many because they recognised that without this, then the system would pose a clinical risk to patients. Clinicians had very strong views around capturing data, populating data and making it available because it impacted them directly in terms of their duty of care to patients. They also needed to ensure that patient's privacy was protected, that data stored about them would be accurate and reliable and that the data was available when it was needed. Thus, the standardisation and comparability phase was important to ensure that all data coming into the system was standardised and comparable. Indeed, this work could not be underestimated as clinicians were pedantic about the precision of results and the importance this had. This was perhaps where there was some conflict with members of IT because clinicians placed such importance on data that they had trouble trusting IT and did not value IT's experience.

Consequence

So, looking at this dimension, there was no real evidence of any dialectic conflict within this dimension. Although both values were observed, there was no real conflict that impacted the project. The personal experience of the PM helped select the project team, find out about the possibility of collaborating with Northern and help make changes that could improve usage of the system to GPs. On the other hand, the hard data orientation was necessary to drive the standardisation work and ensure that this was done to a standard where the data from the system could be reliably used. Thus, both of these orientations have helped the project, so they have been complementary, rather than creating the dialectic conflict that was evident in other dimensions.

4.2.2.4 External versus internal motivation

This dimension examines the cultural values of external and internal motivation and determines their effect on the implementation. Here there was evidence for both internal and external orientations but little evidence of any strong tensions.

Internally, many staff were driven by patient care which was an important motivator for staff. This was not just limited to clinicians, with IT staff reporting this as well. Many of the staff working at the SAHB did so for quite altruistic reasons to help people as the SAHB were not widely regarded as being the best payers. The SAHB also offered an interesting work environment for staff as they got to work with a lot of very clever, and passionate, people. For IT staff, the SAHB also provided opportunities to work in different areas that were not normally available elsewhere. They could get training and take on responsibilities for a wide range of technologies that could enhance their future career prospects.

On the project, there were external motivators in the setting of project goals and milestones that were expected to be completed. This led to some tensions where the project team could finish a piece of work and have that sit with a clinician for a long time until they found the time to review it. The project team did not want to push for this to be completed because they knew this could take the clinician away from looking after patients. The emphasis on 'duty of care' further affected the decisions that clinicians needed to make for the system as they had to be satisfied that ResultSys would not compromise patient care and safety. This emphasis occurred often on the project and was particularly evident with the standardisation work and work on privacy compliance. Clinicians were concerned about ensuring that the data was correct and usable and that patient privacy would be protected.

Consequence

Both internal and external motivators were visible across the implementation. Where there was evidence of tension between these values was between clinicians and the project team with respect to duty of care and the desire to complete the project. Thus, there were differences between these group's motivations which created some tensions on the project; however there is not enough evidence to suggest there were strong tensions or cultural change. This also provided some evidence for subcultural differences between clinicians and IT that has had some effect on the project.

4.2.2.5 Internal versus external change

In this dimension we examine the cultural values of the orientation of internal versus external change to determine what effect they had on the implementation. In this implementation there was evidence for both orientations but again there were no strong tensions between them.

In terms of internal drivers, clinicians drove ResultSys because they did not have access to test results from the community and this could improve patient care. A group of clinicians gave the project a major push in 2009 when they all selected it for a group management training project. This generated a lot of urgency for the project from many areas, particularly Haematology because they used a lot of laboratory results in treating patients. A second benefit lay around the efficiency improvements that could be made from centralising test results. This would mean that test results would not need to be repeated which was a benefit that could lead to cost efficiencies for the SAHB. Indeed, for the Northern implementation, it was suggested that there was almost \$750,000 per year saved as a result of not repeating results. Clinicians also realised that projects could get done quicker at the management level if they could prove that savings would be made as a result of the change. As such, the system was recognised for its benefits and support was given within the capital expenditures committee (CAPEX) to begin the project.

There were also a number of external drivers for the project including laboratories and privacy legislation. Privacy legislation was a major driver because the ResultSys system had to be compliant within existing laws. The SAHB had to ensure that patients would understand their results under the new system and make communication accessible to them about what was going on. There were also regionalisation pressures as the SAHB was required to provide IT services that could be shared across AHB's in the future. Before even completing ResultSys, the SAHB was already talking to nearby AHB's to expand ResultSys to their hospitals too. The desires and requirements of these AHB's then helped shape the implementation so they could connect to these other organisations in the future. Northern was also a major influencer in the ResultSys implementation as the SAHB largely copied what they had done and implemented that within the organisation. Northern also provided advice about different configuration setups that also influenced how the SAHB setup ResultSys.

The SAHB was also keen to comply with external agencies around standards to ensure the ongoing compliance of measures. They did not want to create their own standards and were happy to be guided by national and international standards. This spurred the adoption of the LOINC standards while the SAHB also set up the Southern Quality Assurance Group (SQAG) who would monitor and work towards the ongoing compliance of agreed standards by laboratories. This would ensure that the standardisation work would remain valid into the future and protect the integrity of data in ResultSys. The laboratories have also been an external agent of change because these labs worked with the project team to come up with a set of standards that they would all agree to use. Each laboratory provided standards for different areas and they all worked together to agree on a common set of standards for everyone.

Consequence

The external pressures of the regionalisation work slowed the project down as they needed to rethink the architecture of how everything would connect together. Working with other AHB's also affected the project as they incorporated system features to help connectivity in the future. Further, the use of external standards meant these needed to be sent away to different groups for approval which also had an effect. Lastly, although efficiency was mentioned as an important driver of ResultSys, it was the benefit to patient care which was used to get GPs on board, as their permission was essential for bringing results into the system. Indeed, ResultSys promised important benefits for both clinicians and GPs and these benefits had already been realised in the Northern implementation.

So, within this dimension there have been both internal and external pressures driving change on this project. These pressures have worked in a complementary fashion such that there was little evidence of any tensions between these values. The SAHB seems to be an organisation which is driven both by the internal needs of clinicians, and the important external demands of patients and legislation. As such, this balance between internal and external drivers for change was not changed as a result of the ResultSys implementation.

4.2.2.6 Short term versus long term

In this final dimension, the cultural values of short term versus long term orientation are examined to determine their effect on the implementation. Throughout the ResultSys implementation, evidence for both short term and long term orientations could be seen but these did not result in any dialectic conflict.

There was little evidence of a short term orientation at the SAHB. While there were some concerns that there was not enough of a long term vision applied to the project, this may have been more borne out of frustration from some members of the project team who were not given much of an overview of what they were trying to achieve. There was more evidence of a long term orientation at the SAHB which was particularly evident in the long build-up of the project where different projects were prioritised to create the foundation for ResultSys. Once the project began, there were several decisions that were made for the long term success of the project. One of those was the decision to include pharmacy result compliance into the privacy model which represented the next stage of results to be brought into ResultSys. Another major decision involved the development of SQAG to provide ongoing comparability, validity and integrity of ResultSys into the future. Finally, the SAHB also put in place technologies that were useful for regionalisation and future initiatives as well. ResultSys was a stepping stone towards a shared medical record within the SAHB, and so the foundation was there for increased regionalisation from the work that was done.

Consequences

This dimension has provided evidence for both short term and long term orientations at the SAHB. The SAHB seemed to have a long term orientation which was perhaps consistent with their goal of improving the health of people in the Southern area. The consequence of this long term orientation was an increase in the short term costs and time spent on the project. For instance, putting in place the foundation for the pharmacy work has taken more time but will mean a smoother implementation of this module in the future. Likewise, the time spent on ensuring that ResultSys was compliant with regionalisation should ensure there is less rework necessary when results are shared between AHB's. So, in terms of tensions between these orientations, there has been little evidence of that across this implementation. Instead, the principal impact on the project was due to the long term orientation of the organisation and the increased time and cost this meant for ResultSys.

4.2.3 Summary

So, this case examined the first phase of SAHB's rollout of the ResultSys system. Two dimensions were found to have caused tensions across the project although the net result on cultural change was less evident. Possibly this lack of cultural change was because users

have not had to change how they do their work as a result of the first phase being more passive in nature although there was still evidence of tensions that impacted the project.

The first dimension was concentration versus autonomy. Within the SAHB there were many autonomous units that operated alone and several major external groups that the system affected and which the SAHB did not have direct power over. For instance, laboratories were one group where the SAHB could not directly force them to complete tasks in line with when they wanted those changes to occur. Clinical risk was another important factor as it meant that clinicians often opposed changes which they felt might be dangerous for patients. This occurred often and was resolved with peer based processes that took time. Lastly, staff were not directly accountable to the project team and often prioritised operational over project work so that this took longer to complete. The result was tensions between these groups and project management in trying to get tasks completed. These tensions delayed the project and resulted in higher costs being incurred. In terms of cultural change, it is less certain whether there has been a change or not. At this stage, the centralisation of results does not seem to have reduced clinician autonomy to any great extent although this may have happened in phase 2 when clinicians and GPs began using the system.

The second dimension was process versus results. The SAHB had a very strong process culture. Clinicians often followed strict procedures in treating patients while IT were also very process oriented and had specific methodologies they followed for project development and rollout. The struggle within this dimension was due to the clash between the subcultures of clinicians and IT. Both had process cultures, but clinicians expected the project to be completed quickly while IT were trying to follow correct procedures. This caused frustration between both groups as they felt that the other side did not understand the challenges they were facing. The overall process culture of the SAHB enabled the project as the standardisation, comparability and privacy work had to be completed in a process fashion but the tensions between IT and clinicians added delays and frustrations to the project. In terms of cultural change though, there does not seem to be any evidence of a change at this stage. What this dimension does show though is that tensions can occur between units with the same cultural orientations and that similar cultural values do not always result in smoother projects.

4.3 Case Study 3 – FoodCo’s implementation of SAP

This case study examines the implementation of SAP within FoodCo’s Southern branch (FoodCo), one of the largest employers within New Zealand. FoodCo is comprised of a number of owner/operator stores under three major supermarket brands; SuperPremium, SuperBudget and SuperSmall. The co-operative model is an important part of their success as it meant that owner/operators could tailor their offerings to what was needed locally, and FoodCo could support those operators with the products they needed. Operators were independent businesses who owned and operated their own stores and worked together for their mutual benefit and the benefit of the cooperative. FoodCo could purchase products for all their member stores at discounted prices because they could purchase in much greater quantities than member stores could alone. In addition, they offered a variety of services to member stores such as advertising, printing, training, IT, e-commerce, procurement, retail support and manufacturing. FoodCo also had two major subsidiary operations. WholeCo was a wholesale operation, which sold directly to catering and food services businesses while ManuCo handled the purchasing and packing of commodity products such as flour, rice, sauces etc.

As a co-operative, FoodCo was privately owned so there was not as strong a profit motive as there would be within private companies. They also had a unique governance model which was comprised of a board of directors who were voted in by members with voting shares in the company. Each member had the same vote as another regardless of the size of their respective business; a large supermarket had the same vote as a small convenience store. All members were shareholders in the company so the profits from FoodCo were shared back to members. The corporate organisation of FoodCo was broken up into different functional groups with a general manager in charge of each area. These included retail, administration, wholesale, IT, finance and property. Of these, wholesale was the largest division with 750 staff involved in three large distribution centres. Staff tended to enjoy working at FoodCo because the co-operative environment created a ‘family atmosphere’ for staff and FoodCo sought to look after their employees whenever they could. This resulted in company staff having very long tenures which was reflected amongst corporate staff with many having tenures of 10 years or more.

FoodCo had their own legacy systems which had been built up to suit their needs over a number of years. They supplemented the legacy system with several standard software

packages; payroll was managed by Payglobal, finance used JDE Financials and procurement used JDE Procurement. All other systems were custom built including their own warehouse management system (WMS) and point of sale (POS) system. There were also many systems to suit different needs such as the use of spread sheets or manual processes. For instance, in pricing, staff used a separate book for pricing exceptions that included special terms negotiated for co-op members. So, this mix of systems in different areas of the business meant there was little data integration and visibility across the business. For example, Finance had a big silo of financial data, such that there were innumerable Microsoft Access databases holding different information and all sorts of other manual collections of data. The result was that accounting information for each month was reported late into the following month which meant that there were always lags between managers being able to identify problems and act on them. The systems were also very inflexible, if FoodCo needed to change anything then it became very difficult because of the need to try and integrate each system. It had also become harder to find staff that had the skills to work with the legacy system and it took a long time for outsiders to get up to speed with the system which meant relying on a core group of staff.

A new IT Director was employed in 2004 to address these issues. He found that it was clear that the organisation needed a more integrated approach to their systems encompassing a holistic, end to end approach in terms of data across the organisation. There was also more openness to changing the legacy system as the prior IT director had been wedded to the system. As such, it was decided they needed to investigate ERP solutions and an evaluation process was launched. A project team was organised to work out requirements for a new system and to review the systems submitted by vendors. This team recommended SAP which best addressed the problems at FoodCo while providing a strong blueprint for the future. The project team also worked out a number of financial justifications for the system which helped strengthen the case for SAP and convinced the board to authorise the project. The implementation then began with pretty much every department having to make changes to incorporate SAP and learn how to integrate it. This caused many issues, for instance in the beginning FoodCo appointed their own project manager because they felt that SAP's project manager did not understand their business well enough. After Go Live, there were a number of problems as the organisation struggled to deal with the requirements of SAP. However, after this 'shakedown' period the system has settled in reasonably well at the organisation. The project was ongoing though as they worked to

implement SAP into member stores which was expected to be completed by the end of 2013.

4.3.1 Analysis of dimensions

The implementation of SAP at FoodCo is further examined in this section in conjunction with three dialectics which were seen to create struggles throughout the implementation. These dialectics provide evidence for differences between cultural values of the organisation and the ES being implemented and are examined in this section. The results of this case study are summarised in the following table:

Table 4.3 - Key cultural dimensions from FoodCo case study

Contradiction (Cultural Dimension)	Identity	Struggle	Consequence
Concentration vs. Autonomy (Control, Coordination and Responsibility)	Business units and unit managers were used to doing their own thing and making their own decisions.	Business units had to become more centralised and standardised. Some managers also resisted the loss of autonomy by trying to retain control within their unit.	Standardised processes cut across business units and new development is now centralised. There is more concentrated decision making to support SAP as a shared system. FoodCo has become more concentrated than before.
Isolation vs. Collaboration (Orientation to collaboration)	Business units were used to working alone within a silo culture without much collaboration with other units.	Business units had to collaborate more with other units to share an integrated system because errors and unilateral changes to the system affected everybody.	The involvement of project staff from different units has formed the basis for ongoing intra-unit collaboration. As a result, FoodCo has become more collaborative.
Process vs. Results (Orientation to work)	Business units were used to getting their work done without much consideration of the process involved to achieve that result.	SAP has required more of a process approach in selection, implementation and use which conflicted with staff who did not have that same understanding of processes.	The project overran its budget because gaps were never properly identified or planned for. Staff have had to become more process oriented to be able to use the system and move products through. FoodCo has become more process oriented as a result of using the system.

4.3.1.1 Centralisation versus autonomy

During the project there were struggles between the desire to concentrate decision making versus desire for autonomy. Prior to SAP, business units had their own systems which were connected loosely into a central legacy system. As such, there was a fair degree of autonomy with how they ran their own business. This has been challenged by SAP which has brought in more centralisation and standardisation across the cooperative. This could be seen in three struggles involving business unit autonomy, management autonomy and the retail rollout which created strong tensions for the implementation.

Business unit autonomy

Traditionally, FoodCo was very segmented with each business unit largely working on their own thing. Some areas like procurement and promotions worked across the business but mostly there was a lot of silo type behaviour in FoodCo where units worked alone. For instance, IT often did their own thing and were not very good at communicating with the core business units. There were also divisions between some of these core units, for instance both Wholesale and Retail were quite divided despite the need for integration to provide service to customers. This has now changed to some extent as the SAP implementation has created an environment where centralisation and standardisation are much more important. SAP brought together the diverse systems that were in use so that everybody had to use, and share, a single system.

Oh yeah, yes. Very. And look that's also been an issue for the retail project and SAP is the one system to rule them all and it requires good cooperation between those business units. Historically this organisation has run as a very, in very well defined silos. And SAP has cut, and is still cutting across those silos. And that is still challenging. The culture of FoodCo as an organisation has not really changed sufficiently yet it is still changing, it is heading in the right direction, but a very long, slow process. (Project member)

On the project, this was achieved through the creation of standardised processes that cut across business units. Many of the custom processes that business units had were replaced by either SAP processes or new cross-unit processes. The project team made it clear throughout the project that the business would have to change to meet some of the best

practices in SAP that they wanted to capture. After Go Live, this created an environment where business units had to communicate more with each other. SAP was an integrated system so business units had to give up their autonomy to some degree and communicate and cooperate with each other in their use of the integrated system but this was a struggle for business units to deal with due to their history of working alone. For example, IT sometimes made changes to the SAP that affected other business units but often neglected to provide any warnings of these changes to other units. Another example that occurred was with new promotional types that were introduced by Retail but which were not communicated to Procurement who were most affected by the change.

These provide examples of business units that struggled to cope with the centralisation, and interlinking, of processes that SAP brought to the business. This also affected new development work in SAP. Prior to Go Live, business units would decide what they wanted from new development in the legacy system and persuade IT to assist them. Now there was a more centralised process whereby IT worked with the business unit about a new development proposal, and then a priority was agreed for when the work would proceed. If priority could not be agreed with IT then it could be escalated to the steering board to make decisions. This created a much more centralised process where the needs of the organisation were considered first when deciding on new development. The problem with this lay not with the loss of responsibility by IT, who still had a fair degree of power within the system, but with the wants of business units, who could not make their own decisions about system changes and have to see those changes vetted through an organisational process. Thus, there was more of an organisational view towards what needed to be done for the system rather than business units making those decisions themselves.

Management autonomy

The second struggle involved management autonomy, where the focus was on the autonomy of management staff at FoodCo rather than autonomy at the business unit level. In the review of the legacy system, it was important to get all the executive managers involved on the steering board for the purpose of securing their buy-in for what needed to be done. This recognised the autonomy of managers with the use of a committee that could provide the united drive the project would need. The review process was essential because it brought issues into the open while the relative benefits and weaknesses of the system were made clear. This led to good conclusions about the system and helped pull people along and get them into the right mind-set for the implementation. It was important to

secure the buy-in of executive managers to ensure the project would be able to move forward. This idea was carried into the implementation stage. Project staff were brought together into one room where they would be able to work with other business units more easily to hammer out new processes that were needed. This encouraged more centralised decision making and helped to work against the silo culture that was the norm at FoodCo before the implementation.

Indeed, despite the attempts at centralisation, executive managers, were still involved with signing off on the major decisions of the project. Hence they retained a lot of the decision making authority for themselves which reflected the existing autonomy within the company. This became a problem with a key executive whose main concern was with his own area where he deliberately held the project up until he was completely satisfied with how they would work for his own area. As the module being implemented was a core module of the system, this meant other areas could not work on the system or know how the project would work until the executive's department had finished their part. This then held up testing and the time available for other units to even begin learning the system before Go Live. The CEO did not have the authority to sort out the issue leaving it to the executive's General Manager to take care of the situation as the General Manager had been protecting the executive as one of his staff. In the end though, he caused too many problems and left the company to the relief of those involved on the project.

We did have an issue with [one executive], and my regret was that I should've moved on him, he could only see one way and that was his way and I should've moved earlier on him. It was like [when he left], everybody went "oh thank god!" It was just like this release, so I think that's one failing is that, and I knew there was an issue. The trouble was my General Manager was protecting him and I should have got on it and pushed more there. But anyway, in the end [he left] and my General Manager was happy for him to go. (CEO)

Thus, there was a conflict between the autonomy of staff and the need for centralisation to support SAP that caused real problems in this phase of the project.

Rollout

The last struggle that occurred on the project involved the rollout of SAP to operators. The rollout of SAP to operators had run into problems because the rollout team had tried to ease

the system in. A consensus decision making system was used but that was too slow for making these important decisions. To solve the problem, a new rollout manager was appointed to sort out the rollout and deliver results. The new rollout manager had much more success with a more autocratic approach with operators. This involved telling them in the beginning what was expected of them and what would happen during the installation of the SAP in their stores. This was necessary because of the struggle between centralisation and autonomy that affected the rollout phase. FoodCo needed to standardise operators, as much as possible, to the SAP model they had created, because the work of SAP could not be configured to fit every different type of operator.

The soft approach, that FoodCo had used before the new rollout manager was appointed, did not work because they had tried to customise the system to each store. Instead, processes had to change within each store as staff learned a new way of working in every different area. For instance, butchery staff had to change the way they procured meats and how they recorded stock which meant the adoption of new SAP processes to replace what they had done before. Operators were individual businesses so FoodCo could not force them to change the way they worked as they had their own autonomy. Often operators would have their own products and ran their own promotions so a standardised system where they lost important functionality was not acceptable to them. Likewise, FoodCo could not just force them to change completely because they were dealing with individual businesses they could not directly control.

This represented the struggle between the autonomy of operators and the standardisation needed for SAP. So, the rollout team listened to the operator, and what they wanted to achieve in SAP, and then tried to forge a path that would suit both sides. They would push for standardised processes but customise the system where they could to meet the operator's needs. Also, FoodCo did not try and push stores unilaterally to change. Operators had to take responsibility of the implementation within their own stores. For instance, they needed to select their own change manager to lead this process and liaise with the rollout team during the implementation. Where there were struggles with a store, the rollout team would evaluate the system and pull out if necessary. Often this was due to problems the store needed to resolve themselves before they were in a position to better accept SAP. However, the success of their approach has been where they have directly managed the process and been very upfront with the operator about how the store would need to

change. They developed a very simple change management presentation that was run though with every store before the implementation begins. This tackled everything upfront for the store and told them that the store would change and that resistance would only make the change harder for them.

So we have a very simple change management presentation that we run through with every store before we kick things off in earnest. And it releases, it tackles it upfront because it says things are going to change, you do not have a choice, some of you are going to find it difficult, you can try and undermine us and you can try and resist and ultimately your lives are going to be more difficult because this is going to happen.
(Project member)

Thus, the autonomy of stores versus the centralisation needed to support SAP was a major struggle within the rollout phase to stores.

Consequence

There was a movement away from the siloed behaviour of the past with business units realising the importance of communication when sharing a common system. On the project, staff from different business units such as retail, wholesale and finance were working together in a central project room. This created a core of people who knew people in other business units and which could provide the basis for more cross-functional cooperation after Go Live. Business units had to work together more so this foundation of staff has helped to facilitate this process and reduce the silo culture at FoodCo. The integration problems that occurred after Go Live were reduced as staff began to understand what their individual actions could mean within an integrated system. The autonomy began to break down as staff realised they needed to work with other business units to best use the system for the good of the wider organisation.

Where now all of a sudden we do need to know that if we do something it's affected this area over there. So, I think it's probably actually made the people more smarter, it might not be the right word, more aware of the business itself rather than just come to work and do their own little job and go home again. Actually know more about the business, the big picture. (General manager)

Although, there was still siloed behaviour evident in FoodCo, there was a change away from this behaviour. This was evident from the beginning of the project, where the buy-in from executives was important, to now, where business unit's new development was prioritised for the good of the cooperative. Autonomy was reduced as they shared many standard processes across the company with other business units and they had to work together to make this work. There was more of a consensus approach for new development with staff. This recognised the importance of getting autonomous staff to buy into the project too. Now, there are more sessions with teams to introduce new changes and solicit their feedback so there was more of a consensus approach to change. In contrast, the rollout team had better success when taking a much stronger lead with rolling SAP out to stores. They used a consulting type approach, to best effect, when trying to understand what each store wanted in terms of their goals and involvement. Then they would lay out what would need to happen and present choices for the decisions that they could make. If there was not enough cooperation within the store then they would pull out until there was. This more directed approach was more useful than allowing the store too much autonomy in the decisions they made.

4.3.1.2 Isolation versus collaboration

The major struggle with the implementation of SAP involved the struggle between business units used to working alone versus the need for collaboration that sharing a system like SAP entailed. This extends the discussion of the breakdown of autonomy to focus on the collaborative aspects of this change. So, in this dimension we examine the strong tensions that resulted between the cultural values of isolation versus collaboration.

At FoodCo, business units worked alone and focused on their own areas of the business and did not worry about what was going on elsewhere. The business units used their own systems and were used to errors only affecting their own operations. This caused a lot of problems after Go Live because errors now had global impacts instead of these being contained locally, as before. Thus, it was important for staff to become aware of the importance of collaboration and working together as their actions now had global effects. This collaboration began with the formation of the project and representatives from each business unit were setup within a large project room as part of the project team. The idea was that by being in one area they would be able to collaborate better with other units to the benefit of the project. In the implementation stage staff spent about 18 months working together so that there was a lot of interaction and cross-pollination between these different

groups. Within the project room, each business unit had its own area but the open nature meant that other groups could be monitored so that impromptu meetings between groups were often held when elements of the project were likely to impact both groups.

All the functional group was together and we actually segmented the room into different clumps but generally tried to have it open plan. And the main reason for that is that, one team would overhear over here something from someone so there would be an impromptu meeting to resolve a particular issue, or clarify a point more to do with, or fleshing out a dependency that might have been there. And that worked really well.
(Project member)

So this environment was oriented towards collaboration but also allowed groups to work alone on processes that affected them. Thus, within this more collaborative environment, there was still the pressure for isolation as staff tried to finish tasks within their own area as well as meeting the overall project goals. For instance, the prior example of the executive was a major example of a case where the project was slowed down by groups not passing on information to other groups around them that needed that information. This was no doubt enabled by the autonomy the executive enjoyed but this was also a result of the silo culture at FoodCo where units were used to working alone. This may have been an adverse reaction to the need to collaborate more with other groups and the feeling that everything needed to be perfect in their own area before passing it onto others. Regardless, the autonomy of this executive allowed him to be able to make such decisions and close his department off from collaborating with others on the project.

There was also a separation between those working on the project and those back in their regular jobs. For instance, in IT, half of the department were working on the project while the other half remained working on normal business. This created a separation in the IT team that took a while to resolve after the project was completed. There was not enough sharing going on between those groups as IT became more inwards looking and focused on what they needed to do for the project or their daily work. Thus, it was always easy for staff to slip back into an isolation mode and get on with their own work without considering what was going on with those around them. This highlighted the importance of change management to get staff ready for the change to SAP and the collaboration that was needed to support the system. SAP required business units to work more closely together because of the integrated nature of the system. For instance, new promotions from the promotions

department required collaboration with procurement to determine how this would affect each department in terms of new stock to be ordered etc. Also, for Christmas orders, different business units needed to work together to decide what needed to be ordered, stored and distributed to member stores.

So they had no need for someone in inward goods to even think about what they were doing previously and what impact that may have on the total store as a whole. Now, obviously, inwards goods is one of the key components, key areas, of the whole ERP system. They have to get that right so there is a lot more coordination, cooperation between business areas throughout any area within an organisation as a result of having an ERP system. You all have to work together, you have to think when you're doing something, why am I doing this, what's the impact on other areas if you're making changes, you have to consider the whole business not just your own particular area. (Project member)

This has meant the organisation learning to work better as a team, with business units collaborating and working together. Indeed, the CEO mentioned that one of the key learnings from SAP was the value of an integrated system and that everybody was now working as one team. Thus, SAP created a more collaborative enterprise between its business units which also allowed the company to collaborate better with suppliers too. Vendor managed inventory (VMI) programs allowed vendors access into SAP so they could manage stock more efficiently in line with targets set by FoodCo. These collaborations could yield efficiency gains for both FoodCo and vendors. One example of this was in discussions with their bread supplier, whereby through collaboration, they could more efficiently stock bread for stores to reduce costs for both parties. Thus, the system enabled more collaboration between both suppliers and between business units internally. However, this was not an easy process as staff struggled to understand how to work within an integrated system such as SAP.

Consequence

The struggle between the silo culture and the need for cooperation in SAP resulted in a shift towards business units cooperating more with each other as staff learned to work with the system. As such, business units needed to improve their communication with each other to better use SAP. SAP created the need for better communication as people needed to know what was going on with changes that might affect them. Indeed, the problems the company

experienced after Go Live provided the 'baptism of fire' that was needed to make people understand the importance of communication and collaboration in SAP. The integrated nature of SAP was a big shock for staff and many of the early shakedown problems were due to staff not being aware of the global reach of their actions. This remained an ongoing problem but there was an impetus there for staff and management to improve.

Could be better. And I think we are all challenged with that. One of the things, certainly in [my division] we try very, very hard and I think we set some reasonably good standards about communication. We try to consider the fact that if we are needing to do something, who needs to know about it. (General manager)

Other business units may not have fully embraced the change towards cooperation and still lean towards a silo culture. However, there was certainly a movement away from the silo culture that existed previously towards more collaboration at FoodCo. This was proven to be a necessity to support SAP as an integrated system, but was a shift which was still ongoing at the company and where there was still plenty of improvements that needed to be made.

4.3.1.3 Process versus results

Traditionally, FoodCo has been a company which has been more results oriented than process oriented such that getting work done was more important than it was done. For example, when a business unit wanted to make a change to the legacy system they just got in touch with IT, told them what they wanted to do and let them get on with it. In fact, the legacy system had become such an arcane part of the company that many staff knew how to use the system to get the results they wanted but no longer knew how it worked internally to actually make that happen. In contrast, an ERP system required strong processes which defined how the system would work for the company. As such, there was a variety of struggles across the implementation due to the difference between the results orientation of FoodCo and the process orientation inherent in the SAP implementation. These struggles occurred in the areas of planning, SAP processes and the retail rollout and affected the implementation.

System planning

In the planning stage, there was a struggle between the importance of good processes for ERP selection and the need to select the system as quickly as possible. This process approach dominated the initial proceedings as a lot of different documentation was created to help FoodCo work out what they needed to do and what the goals of the project should be. However, when it came to work out what was needed from the system, FoodCo decided not to create a detailed RFP because they did not want to spend too much time working on it. They feared that the business environment would have moved on by the time they had gone through the process of working out what they needed.

Well, we had some broad outline requirements, we did not do a detailed RFP, we did send a document out though that was more a request for information or something like that. ... But in terms of selection that's really as far as we went. We wanted to know, would it work, and how long is it going to take and how much is it going to cost? (IT project member)

Instead, they favoured a faster approach over a more detailed, process oriented approach which may have helped them better identify everything they needed in the system. They decided to go with a time and materials costing from SAP to avoid having to fight with the vendor over requirements that may or may not have been included prior in the specifications for a fixed price contract. This was important when they had not worked out all the details of what they needed in the first place. Although, the impact of this later on would be to find out that SAP's promotion module would not be suitable for FoodCo which would involve extra time and significant costs to rectify.

We did a time and materials project alright? So you could have done a fixed price or a time and materials. The reason we went with time and materials was that we did not end up fighting that it was in the scope or not in the scope. You can argue whether we were right or wrong and I'm still doing time and materials today because at the end of the day I want a product that works. I don't want a product that I put in that I'm not happy about. There is a line there, alright? But you've got to have a product that works. (Project manager)

The project team were also very focused on achieving a successful implementation and they were motivated not to be another statistic of a failed SAP implementation. They realised that the real benefits of the system would come when it was rolled out to member stores and they could realise system integration from the store to the supplier. Thus, the drive for FoodCo to complete the implementation successfully meant they spent what was necessary. This resulted in a cost two or three times over what was budgeted although they did try to justify the additional spending with the benefits they expected to earn from the system. Thus, there was a struggle between the importance of processes and planning, such as the discipline of developing an RFP, and FoodCo's desire for quicker action which was consistent with their results orientation.

SAP processes

Once SAP was selected as the new system, a test system was created from which an iterative process could be used to configure and develop the system with the new processes they would use. However, staff did not always understand the process demands of SAP, or how workarounds from the old system would fit into SAP.

We had some [staff] in [a key area for the SAP implementation] that had been doing [the job] for 20 years, doing a very good job but [they were] showing - this is what I do. [But they] did not know how that [particular process] worked. [But} we had [them down] as the subject matter expert coming in and configuring SAP and [so] we got ourselves into a [mess with the] data. (Project manager)

There were also situations when the legacy system had been fixed to deliver a necessary result that was not part of how it was supposed to function. For instance, there were cases where some products had extra information within the description field that bent the system for a particular purpose. These were almost never converted into SAP because staff did not know about them and the system worked with the data available already so that they supposed that it would work the same way in SAP. So, there was a real struggle trying to setup processes within SAP when staff were not used to thinking in a process-centric way and have an understanding of the processes behind how the system worked. This was also a problem after Go Live as staff quickly had to learn to attend to processes and no longer have the mind-set of getting work through the system as quickly as possible. SAP required each step to be properly completed for work to flow throughout the system. In the legacy system staff had become used to shortcutting the system to get work done, consistent with their

results orientation. In SAP, this was either not possible or created more problems than it solved.

Yes, it became more, certainly, the discipline, there were processes, SAP introduced processes to our business that we had to follow, you could not kind of bypass one to get to another. ... So, definitely more discipline and, I'm not saying our old systems were not disciplined, but there were always workarounds and when you're running the systems for so many years there were probably shortcuts. (General manager)

This created many problems for staff that had been used to the legacy system just working for them. Now they had to consider what they were doing at each step and they had to understand it. It also took longer for staff to complete the SAP processes while they were getting used to the system and there were complaints as they compared this to the speed of using the familiar legacy system. This period was described as a depression period for staff as they struggled to become accustomed to the system and the new ways of working. Some staff just could not handle the new processes and disciplines and either changed positions or left the company. Indeed, staff had to become more accurate in checking products into the system because the data they entered was now used in so many different ways. For instance, the product dimensions and weights, were used for logistics (how many can we stick on a truck) and retail (how many can we stick on a shelf). Attention to these details, and picking up supplier errors, also proved beneficial to the company and they realised cost efficiencies from it. Thus, the setup and use of new SAP processes created many problems for staff that were used to just using the system without understanding how it worked.

There was also a change in how processes were modified in SAP through change requests and new development work. There was much more freedom around changes to the legacy system which was handled informally by IT. Now, change requests and new development had to be much more structured because changes could impact on so many different areas if not properly implemented in SAP. Further, changes could also have an impact on the ongoing cost of upgrades to SAP. Thus, a much more rigorous process was required to screen developments before they could be authorised which required process change documentation and new testing regimes. For instance, new developments were tested within the business which made for a stronger process because the business was in a better position to determine whether something was working or not. Further, consistent with the rest of the businesses use of SAP, new developments in SAP had also become more process

oriented. This created frustration with some business units as decisions about development was centralised at the organisation level which prevented ad hoc development for business units. There was further frustration with the new process because of the amount of documentation required to make changes when it was so much quicker and faster before. This illustrated the ongoing struggles as the organisation was forced to become more process oriented to support SAP.

Retail rollout

The retail rollout also saw struggles as member stores had to become more process oriented to support SAP. Store staff struggled to get to grips with the process orientation of SAP and new, unfamiliar processes such as purchase orders and inventory control. Thus, stores which were more process oriented were easier to install SAP into because they already had an understanding of processes and some of the disciplines that were needed to service those processes.

Yes, because they all have different processes. Some have quite a process-centric view of their store and for us that makes it a lot easier. Because they have a good understanding of how the store functions and we can change that as required. And then it's just a matter of overlaying the system onto it. Those stores which are not process-centric are much harder work for us because they operate by a lot of tacit knowledge rather than acknowledged process. (Project member)

Where stores did not have that process orientation, it was harder to implement SAP because they did not understand why they needed to work in particular ways which made it difficult to translate their business into SAP. Some stores also expected FoodCo to come along and setup SAP without them having to do any work. This was very much a results orientation which disregarded the decision making and involvement that a store would have to put in to get a good result from the implementation. For these stores, it was much harder for them to accept SAP, because they also had to change the way they worked. Thus, just as in the corporate implementation, member stores struggled with SAP when they valued results and they had to change to a process orientation.

Consequence

So, in the pre-implementation, the results orientation of FoodCo meant they favoured quicker, more decisive action when examining and selecting SAP. As a result, they did not identify all the gaps that might have come from a more process oriented approach. Such an approach may have identified the lack of functionality in SAP's promotion module which they later had to replace at much additional cost. Indeed, the focus on a successful implementation meant that costs spiralled more than if it had been better planned. Although, the benefits they received from SAP outweighed the cost. During the project itself, staff struggled with implementing the system because they were results oriented, and SAP required a process orientation. Staff knew how to do their jobs but did not understand the processes involved, so had difficulty translating what they knew into SAP. This created shakedown problems after Go Live because the setup of products in SAP was incorrect and they had to identify those and make changes. Further, as SAP is an integrated system, these initial problems snowballed across the organisation which took a long time for FoodCo to rectify.

We had awful master data problems because what we assumed people had done, they did not really understand how the data now works, presents itself in an ERP system. I can still remember, and the CEO might if you talk to him, I talk it about it as, a pallet of Roses chocolates went out the warehouse, we charged the store a million dollars. Alright? And we often talk about that now, and again it was all around the data. So we spent probably two years getting to understand it. (Project manager)

Staff had to become more process oriented in using SAP. They could no longer just do their jobs in an ad hoc fashion and instead needed to understand the effects of what they were doing in the system could have flow on effects throughout the organisation. This required staff to be more disciplined in what they do and led to staff being more process oriented. This was seen in IT where there were much better processes for evaluating new development work in SAP. IT had to setup processes to better evaluate, prioritise and test new developments for SAP because of the problems if new developments were not tested adequately. Member stores also had to become more process oriented to use SAP. SAP was much easier to implement in member stores that had a process orientation than at those without. SAP then provided stores with much more control and accuracy over their businesses as a result of having better processes. Thus, the impact of SAP on FoodCo has

been to push the company to being more process oriented which was a change that created many struggles with how they worked previously.

4.3.2 Other dimensions

Here, the remaining five dimensions from this case study are briefly outlined. These are dimensions where there were either minor struggles within the dialectic or little or no evidence of struggles. In these cases, this could indicate a balance between opposing forces or alignment between the values of the ES and the organisation.

4.3.2.1 Stability versus change

FoodCo was very stability oriented which was evidenced by lengthy staff tenures and the use of the legacy system which was in operation since the early 1990s. The SAP project required staff to change which created struggles between the desire for stability and the need for change that was brought about by the project. This struggle between change and stability was played out in three areas; staff change, process change and system change.

The first struggle was due to the readiness of staff for change as staff had been doing the same thing for many years and would now have to re-examine everything they had learned. Since there were no major changes prior to the SAP implementation, staff and management did not know what to expect of the project so did not know how to cope. As a result, staff exhibited various degrees of coping failures in response to the change. This was exacerbated when the project began to miss deadlines and further pressure was put on staff as a result. Management had learned about change management prior to the change but still lacked experience in having to actually deal with it. Staff were pushed to meet deadlines and required to confront change at a greater pace than they were comfortable with.

The second struggle involved staff being forced to confront changes in long held processes and replace them with new SAP processes. Staff had to make many decisions and their lack of experience with different systems meant they struggled. They did not understand the goals of SAP as their experience was with a non-integrated system. Staff were put in charge of driving these changes where they had been responsible for these processes in the legacy system. This was a problem for staff that knew how to do their jobs, but did not understand why they did them the way they did. They did not understand the rationale of the processes they used and they could not understand how to translate this into SAP. Some staff coped

with this change, others did not, and some were replaced. For instance, in the management position looking after the Article Master module, one of the senior managers had to be replaced with a new manager who had the skills and drive to better manage this key component of SAP.

Lastly, staff were forced to confront change which they had not had to do for a long time as the previous CIO had been so committed to the legacy system. The appointment of a new IT General manager, ushered in fresh thinking and the drive to introduce new systems. This coincided with internal and external pressures that were building on the legacy system which was struggling to cope. IT could see the tide turn and they helped convince executive management of the need for change. However, change was limited and the warehouse management system, human resource system and the point of sale system were not considered for change that could be too much for the organisation to handle. Other technologies did have to change, such as the IT infrastructure platform so they could use the same platform as others running SAP. Thus, there was a struggle between maintaining stability and the need for change to support SAP.

Consequence

For management, the way to deal with the struggle between stability and change was to make SAP use mandatory for all staff. This had several consequences as the pace of change caused some of the coping failures that staff experienced. To cope with resistance, management put in place systems to curb this before it became serious. Some usability changes were also made to the SAP to help bring users on board. Indeed, the lesson FoodCo learned, was that they needed to have a more consultative approach to change in the future. Further, there was a shift towards staff being more change oriented as they sought to extend the SAP system and bring in new functionality. Staff were also more open in their consideration of changes for other key systems at FoodCo which were not considered for the SAP project. Thus, FoodCo were stability oriented before the implementation, and as a result of the changes they have been exposed to, have become more change oriented as a result of having gone through the implementation.

4.3.2.2 Hard data versus personal experience

FoodCo was an organisation focused on hard data over personal experience. This was perhaps not surprising when the cooperative was so focused on maintaining or improving market share in the high volume, low profit grocery business. This orientation was seen

throughout the project but was often complementary to the process so no strong tensions were evident.

SAP was a system that encouraged a data approach and the implementation of SAP seemed to have reinforced the existing values more than provided the impetus for change. In the pre-implementation stage, the formulation of a business case was an important way for the cooperative to assess the benefits of a new ERP system although the board were sold on the need for improvement in existing systems. So, an intuitive approach was favoured over a selection based solely on a favourable business case. Personal experience was also important as the pre-implementation team visited several reference sites to see what had been achieved elsewhere. In part, this also gave them an opportunity to investigate some of the SAP horror stories they had heard about and see for themselves what had happened.

Once the project kicked off, there was evidence of a struggle between the official communication on the project, the hard data, and the rumours and word of mouth communication that staff heard from each other, the personal experience. The change manager was mindful of this and setup official communication channels that would be used to provide a counter-point to rumour and misinformation. This was important for change management as well so staff could see what, and why this was happening. This seemed to work quite well because there was never any major resistance from staff towards SAP. Indeed, staff were not afraid to speak out during the project and there were many opportunities for staff to discuss what was going on, with such feedback being fed back to the steering board to take action if necessary.

After Go Live, the major problem was with the lack of custom reporting from SAP which the legacy system had supplied. It was only when the business warehouse was implemented, some 18 months later, that managers could develop custom reports from SAP. This has proven to be a great benefit for staff because they have more information from the business than before. Data was used for benchmarking departments and staff for performance and even member stores could be assessed under given benchmarks to ensure they were accountable for their performance as well. Good quality data was also used to motivate people, particularly operators who were very competitive. Letting someone know that they were not performing as well as others could be a good incentive for them to improve performance.

Consequence

In the pre-implementation stage, the selection process around the ERP favoured an intuitive process that was supported by the hard data of the business case. In this sense, the two dialectic values helped the project rather than to create a struggle that caused problems. In the implementation stage, there was evidence of a struggle between hard data and personal experience as the use of official communication was intended to counteract staff word of mouth that could have damaged the project. The data available in SAP also meant more data is used for reporting and control than what was used in the legacy system. This has meant that data accuracy has become important because the same data could be used in so many different places. This worked to reinforce the company's focus on hard data. Thus, the overall impact of the SAP was to reinforce the cooperatives orientation towards hard data, which was already consistent with the values of the SAP.

4.3.2.3 External versus internal motivation

In this dimension we examine the values of external versus internal motivation to determine what impact they had on the implementation. In this dimension, both values were evident but no tensions resulted so they worked in a complementary fashion to support the implementation.

Staff at FoodCo were well supported both internally and externally by their employer. There was a lot of external encouragement for staff due to the caring, cooperative culture at FoodCo. This was shown at the cooperative through regular family picnics and generous sickness leave for staff and their families. In addition, there were also regular bonuses and perks such as parking and free cafeterias. In addition to the external motivation of staff, there was good internal motivation as well. Workers were exposed to variety within their jobs which helped maintain interests in what they were doing.

During the project, staff were primarily motivated by external means. In fact, the principal tactic was to create a team based environment so that staff could work together and motivate each other. The corporate managers were also instructed to go in and support the team in any way they could, whenever they could, to make sure staff knew that what they were doing was valued. When the project really started to get busy then project management actively tried to ease the pressure on staff through get-togethers outside the project. Staff were also motivated by the benefits of the system and this was prominent

after Go Live. Thus, the motivation for the project was largely external and there were few struggles between internal and external motivation during the project.

Consequence

Staff at FoodCo received lots of benefits so they were not as performance oriented as they could have been. SAP improved this as more data was available for performance which could be used to challenge workers. There were also a variety of internal and external motivations that helped staff begin using the system after Go Live through the initial problems that occurred. These different motivation forces were complementary throughout the implementation and did not result in any tensions between these values.

4.3.2.4 Internal versus external change

FoodCo was more internally oriented due to the size of the company and their history of developing and using their own legacy system. With the SAP implementation, they had to learn how to deal with a strong vendor who had their own ideas about how the project should progress. Thus, there were struggles that occurred in the selection of SAP, process configuration, rollout and impact on suppliers.

In the pre-implementation stage there were a number of factors both internal and external that were pushing for changes to the existing legacy system. The main internal drivers were due to the legacy system's cost, lack of integration and its link to the silo mentality at the cooperative. The change of IT general manager was important because the previous manager had been strongly committed to the system so that there was no internal demand for change. Under the new IT GM, the problems with the system were revealed which created internal pressure for change. In contrast, there were also some external drivers for a new system. Principally there was a feeling within the board that the company was falling behind its competitors in the strength of their information systems. Once the decision was made to look at new systems, consultants were brought in to advise on the RFP process and provide external input into it. Once the steering board began looking at replacement systems they started looking at different reference sites. These visits helped show what these systems could do and provided insight into how best to implement them.

Within the implementation stage, struggles occurred between what the business wanted and what the SAP consultants wanted. Business units wanted to change processes to suit how they worked which took the form of change requests, while SAP consultants wanted to

implement standard SAP processes wherever possible. Indeed, many of the change requests were to try and make SAP more familiar to FoodCo. The project management had intended to try and change as little as possible with SAP but change requests challenged this thinking. FoodCo were also swayed to change their server infrastructure because they were using a platform which was not used by other companies with SAP and they did not want to be the odd one out. Thus, there was a real struggle within the implementation between the internal demands of FoodCo versus the external desires from SAP with how they wanted the system configured.

After Go Live, the SAP not only impacted upon the organisation and its member stores but also on its suppliers. Indeed, FoodCo has the mind-set to treat people as they want to be treated themselves. As such, they were happy to listen to suppliers to see how they could best help each other. This supplier relationship was damaged as a result of problems experienced due to promotions and discounting in SAP after Go Live. This required major clean-ups of data by both parties and created a lot of external pressure from suppliers to ensure that these sorts of problems did not happen again. SAP also provided more opportunities for both parties to work together more closely as a result of vendor managed inventory programs. SAP has created an environment where supplier demands can help inform how FoodCo both uses and develops their system.

Consequence

In the pre-implementation stage, internal and external pressures were largely complementary to the process. Once the project began, there was external pressure from SAP consultants because staff did not understand what SAP could do and SAP wanted to customise as little as possible. This ran counter to business units who used customisations to make the system more familiar to use. This internal/external conflict extended to how the project was controlled with both FoodCo and SAP wanting sole control of the implementation with the result being joint project managers from each. This symbolised the tension between these two values but also showed how they could come together for the good of the implementation. SAP also allowed suppliers to better connect into the system which has opened up changes to being driven by suppliers in the future. So, FoodCo's more internal orientation was challenged by the SAP implementation and the need to have to deal with more outside parties who had a keen interest in how SAP was now used. This suggests that the effect of the implementation was to make FoodCo more externally oriented than before.

4.3.2.4 Short term versus long term

FoodCo had a long term orientation towards growth and sustainability to maintain the cooperative as a whole so that everybody could benefit into the future. However, although there was evidence of both short term and long term values within this dimension, there was no evidence of any strong tensions that affected the implementation.

During the project there was a short term orientation and this could be seen with how quickly the planning and selection of SAP was done. There was no detailed RFP conducted because they favoured speed over the time taken to more effectively plan the project. This was also a factor in the implementation stage as there was concern over whether they spent enough time in the blueprinting process as this may have uncovered some of the issues that caused problems later on such as the need to set aside issues that would otherwise have slowed the project down. One of the largest of these issues involved the promotions module, which was set aside during blueprinting and which was difficult to re-integrate back into the project later on. Thus, for issues that were parked, the focus was on not getting bogged down even if this meant more cost and problems later on to re-integrate those issues.

In terms of long term orientation, FoodCo wanted a system they would be able to use for the next 20 years. So they were happy to do whatever was necessary to make that happen, which included selecting a time and materials budget from SAP so they could ensure that the delivered system would work the way they needed it to. This was also a factor in the system selection where they chose SAP over Oracle because at that time there were question-marks around their long term direction because of a recent acquisition they were involved with.

Consequence

The speed of the implementation in the first stages of the implementation was indicative of a short term orientation which helped drive the project. There were concerns at various points about whether project management were making the right decisions for the long term success of the system, notably these were in the blueprinting and Go Live stages. Bad mistakes here could have severely compromised the system so there were some tensions between getting the project finished on time and the need to ensure that it would be a successful system for the future too. However, there was not enough evidence to show any strong conflicts that affected the implementation because of this.

4.3.3 Summary

So, in this case study there were three dimensions where there were dialectic tensions that affected the ES implementation and where there was evidence of cultural change.

The first of these was between concentration versus autonomy. Within FoodCo there was strong business unit autonomy as units were used to working alone making their own decisions. The implementation changed this as staff now share a common system and standardised processes that cut across business units. This reduced autonomy and meant more centralisation within the cooperative. This was seen with the leaders from each unit being brought together to create a shared vision for what was to happen on the implementation. However, these more consensual processes were not always effective as the retail rollout struggled with this approach. The rollout team found that it was better to push changes onto the operator rather than to try and customise the system to them. A more centralised approach was more effective for the rollout. Thus, the consequence of these struggles was the noticeable movement towards more concentration as business unit autonomy began to break down due to the centralised nature of SAP. Staff must work more closely together and communicate more as they share a common system together.

The second dimension where there was evidence of struggles was isolation versus collaboration. As noted previously, FoodCo was a very siloed enterprise and business units did not work closely together. There was then a very real struggle between their desires to work alone and the collaboration that was necessary to share a common system. Mistakes and changes to the system could affect more than just those in a particular area so more collaboration was needed between units to support the global nature of the system. This has brought the business units closer together as they must now work together as one team. This attitude has spread to their relationships with suppliers as they look to use collaboration to bring additional benefits to both parties. The consequence of these struggles has been the movement towards more collaboration within FoodCo which has been important to support the system. SAP has created the need for better communication across business units so people know what is going on and what changes might affect them.

Lastly, there were also struggles due to the process versus results dimension. Traditionally FoodCo was a results oriented company where getting work done was more important than it was done. This was seen in system planning where the planning was rushed because they

wanted to get the system started which meant they did not identify all the gaps that might have helped them better implement the system. Staff also struggled to adjust to SAP and they did not understand the process demands of the system. Under the legacy system they might have skipped steps, used workarounds, and did whatever was needed to get the desired result. This did not work in SAP, or was counter-productive to how the system worked. This was also a problem on the retail rollout as operators that were not process-centric, often struggled with SAP and its process orientation. The consequence of this struggle, was that staff became more process oriented from using SAP. Staff needed to understand what they were doing at each step because this was important for how the system worked and was necessary for achieving results in the system.

So, this case examined the FoodCo's implementation of SAP. Next, the final case is examined which presents SCC's enhancement of an SAP system.

4.4 Case Study 4 – SCC's SAP enhancement

This case study examines the implementation of an asset management system into the Parks business unit of Southern City Council. The asset management system was essentially an enhancement of the council's existing SAP system to enable the use of SAP's asset management module. This system would replace the disparate and individualised systems currently being used throughout the Park's business unit. The implementation involved reconfiguring aspects of the asset management module, reconfiguring its links to the finance module and the development of a business to business (B2B) interface to the council's large group of contractors to schedule necessary asset maintenance through work orders. The Parks implementation would be the first of an ongoing project to rollout asset management to other areas in the Urban Environment Group (UEG) to which Parks belongs. Parks was chosen for the initial pilot because they had the weakest systems within UEG and they held a variety of assets that were used in other departments as well. The project also involved the development of asset standards which were adopted and revised from international asset management standards (IAMS). The incorporation of these standards would be carried into these other rollouts.

The Southern City Council was one of the largest councils in New Zealand responsible for the needs of around 500,000 residents. The council was made up of elected members, known as councillors, eight community boards which advocate local community interests, and a

corporate organisation led by the Chief Executive Officer. The corporate organisation was responsible for the day to day running of the council's facilities and assets such as parks, libraries, community events, rubbish services etc. The corporate organisation was divided into a number of key service areas, such as community services, corporate services and human resources. UEG was one of the largest services within the corporate organisation and was responsible for running, and maintaining infrastructure for the council. Within UEG are three main departments; Transport, City Water and Waste (CWW) and Parkspace. Parkspace, or Parks as it was known, was responsible for the maintenance of a range of parks throughout the city divided into urban parks and regional parks. Urban parks were tended by a variety of large and small contractors who maintained them in line with contracts agreed with council. Parks employed contract managers to manage the relationship with these contractors and to ensure they were meeting the specifications outlined in the contracts. For rural parks, the council employed its own internal ranger service to conduct the work. Parks was responsible for looking after and maintaining a wide range of assets, worth many millions of dollars and including assets like roads, equipment, furniture, buildings and a variety of other assets found in parks.

SAP was first implemented at the SCC in 2000 and was mainly used for timesheets, finance and purchasing. SAP had all the elements necessary to support asset management at the SCC. However, the asset management module had never been implemented for Parks as they felt that the module would not adequately meet their needs nor did it do what they wanted it to do. This module was used in a limited fashion in a few other areas of council. For instance, the property department used some of the asset management module to manage their maintenance programs. This illustrated the fractured nature of the take up of SAP at council where it was left to individual departments to use, or not use, as they wished. There was never a concerted effort to get SAP, or its modules, used throughout council. Instead, the system had essentially been fiddled with by different areas so they could adopt it and use it how they wanted to. A result of this fractured take up of SAP was that it had a very poor reputation within the SCC which was not helped by issues with its usability. Users regarded SAP as a clunky system, which was not easy to use in comparison to newer web based systems with much better user interfaces. Thus, despite the ability of SAP to do the work required, many users were simply turned off by its usability aspects. Further, many users were not familiar with the system or adequately trained in its use as SAP was not

widely used in the organisation. As such, SAP had a lot of mystique about it but not in an overly positive way.

Parks had a history of prior systems for asset management but these had not worked out. The result was a diversity of practices used throughout Parks to look after asset information in a number of different databases. Staff collected information they needed in a variety of spreadsheets and Microsoft Access databases which met their own data and reporting needs. The lack of an overarching system though, has meant that it was also very difficult to share data across staff as it was not standardised in any way. Because there was no standardisation of data, it was very difficult to move data between these different systems. The result was a lot of inefficiency, as staff wasted time copying data from one system to another so that it could be used in a different way or for a different purpose. There was no long term planning done for any assets because of the difficulties in gathering information about particular assets together from all these different sources. Staff would use their own intuition and experience regarding the assets to work out what needed to be done. These intuitions were often backed up by the need to have to search through the information available to determine the history of the assets in question.

There had been a growing need for assets management in Parks. On the external side, the introduction of new government regulations increased the need for external compliance. There was pressure from regulatory authorities to tighten up the management of assets in line with the Local Government Act (LGA) of 2002. The LGA required councils to provide good stewardship of assets and there was increasing pressure on councils to know what assets they had, how they would maintain them, how they would renew them and how they would manage them. Regulatory authorities audited these plans and had become increasingly concerned with the management of assets at the SCC which created pressure on management to address the problem. Coupled with these external pressure were internal pressures to improve asset management. Internally, Parks had never had particularly strong systems for managing assets. Several reports were done by consultants that found that Parks was lagging behind other areas in UEG and needed to improve its systems to more consistently manage and track their assets. This reflected the needs of operational staff who felt that systems did not meet their reporting or analysis needs. Management had also begun to realise this as they tried to coordinate expenditure in UEG and link it back to community plans. Systems were weak across UEG but the systems in Parks were the

weakest, and because they had a variety of asset types then Parks made a logical starting point for a new project to address asset management in UEG. This sets the scene for the subsequent implementation of SAP Asset Management in Parks.

In the next section, three dialectics are examined which became apparent in the implementation of the new system because of the conflicts they caused. This section also provides further detail on what happened in the implementation and the cultural dynamics involved.

4.4.1 Analysis of dimensions

The enhancement of SAP at the SCC is examined in this section in conjunction with three dialectics which were seen to create conflict across the implementation project. Each dialectic provides evidence for differences between the cultural values of the organisation and the ES project and the struggles that resulted. In line with the dialectic analysis performed, the struggle between values is detailed followed by an analysis of the consequence of each struggle. The results are summarised in the following table for this case study:

Table 4.4 - Key cultural dimensions from SCC case study

Contradiction (Cultural Dimension)	Identity	Struggle	Consequence
Concentration vs. Autonomy (Control, Coordination and Responsibility)	Within the SCC there were common goals and priorities aimed at meeting the needs of the community and regulators. However units had their own priorities, goals and ways of meeting such goals.	Units often did not share a common purpose, and had their own processes and ways of working. These they had to mostly forego in favour of centralisation of processes to support the ES implementation.	<i>Disruptions</i> as units could not agree on common goals and struggled with having to give up power and responsibility. More <i>central monitoring of staff</i> and senior manager involvement to <i>rectify disputes</i> . As a result, the SCC became more concentrated.
Personal Experience vs. Hard Data (Basis of Truth and Rationality)	Reliance on personal experience to solve problems; use of data for problem identification and resolution was more often confirmatory and second to personal experience.	Contract managers had to become more data oriented to use the system, which conflicted with their focus on personal experience for identifying problems.	Different groups struggled with the SAP depending on their orientation to hard data vs. personal experience. Contract managers struggled as the SCC became more data-oriented, while Asset Management (AM) staff embraced the change as the system fitted well with their data-orientation
Results vs. Process (Orientation to Work)	Results were most important at Council but the way in which work was done often had an impact on the results that were achieved.	There was a mix of value orientations in the Council with units holding conflicting views regarding the process orientation of the SAP; most struggled with abandoning their results-orientation for a process oriented approach. Contract managers struggled to change from their results based 'fire-fighting approach' to a more planned approach to work management.	Contract managers, though resistant, have become more process oriented as the system requires the orderly collection of information if its benefits are to be achieved. The change has resulted in the SCC becoming more process-oriented than before.

4.4.1.1 Centralisation versus autonomy

In this cultural value, the dialectic is between forces promoting autonomy and forces promoting centralised control. In this study, there was conflict between the autonomous SCC and forces promoting standardisation and centralisation that were part of the SAP enhancement. In this section, this struggle is examined at the general level before the discussion is focussed to examine the impact on processes, where much of the conflict occurred.

Concentration of power versus the autonomy of staff

There was a lot of autonomy at council. The SCC was built up from the conglomeration of many smaller councils and independent businesses over time. This provided the basis for the autonomy that existed because although these units have been brought together, there had been little attempt to integrate these units together. For example, one of the main divisions in Parks was between urban parks and rural parks. One looks after parks within the city, and the other larger parks outside the city and each was viewed as almost distinct entities with different rules, responsibilities and organisation to the extent that there was hardly any cross-pollination between each group. Another example lay with the variety of departments looking after Park's assets such that one of the Parks contract managers found that new gates and fences had been installed on one of her parks and she knew nothing of it until a neighbour rang to let her know. This behaviour is enabled by the autonomy that existed at council and the lack of consequences related to it. To counteract this isolationism staff were brought together from different areas to work on asset management and the requirements for the new system. They began the process of breaking down some of the autonomy of staff and putting them in good stead for when they would need to start using the system together. This began with a series of workshops with high level staff.

We spent three months going through all of that. So those unit managers understood what we were trying to achieve and were bought into it and we kept them on the operational board and kept pushing and pushing and pushing. The IT systems part was actually enabling through the capture of information it's almost on the side if you know what I mean. The real game was improving how we go about asset management.
(Project manager)

This process was not just to get their feedback into the project; it was to involve them in the decision making, and they had to actively sign off on everything that was agreed to. This mechanism secured their support of the project and agreement on how these new processes would work at council. This was necessary because the project covered so many disciplines in council, such as properties, sewers, parks, land drainage etc., that it could only succeed if it was done collaboratively. The project team could not go to each individual area and sort out what they wanted. This collaborative approach also provided the basis of agreement for the subsequent implementations as well.

The need to involve so many different staff created a unique governance structure for the project which has since been replicated for other big projects. This involved a steering board, an operational board and the project team. The steering board provided governance for the project and oversight on budgets and timelines. The operational board included unit managers and this board worked on the specifics of how asset management would be used. The project team included a combination of management staff, IT staff and representatives from groups such as Finance and Parks. The project team worked directly on the project and passed any problems they encountered back to the operational board to resolve. The project manager (PM) was then responsible for planning the project and reporting to each of the boards about project progress. He also helped select who was involved on the project by deliberately identifying who was responsible for different assets and which groups held influence. This was used to select different boards in order to nullify some of the resistance that might otherwise have occurred. This structure centralised a lot of the decision making which was key in dealing with all the different autonomous managers that were involved in this process. It brought these staff together in a way in which they could work collaboratively in pursuit of the goals of the project.

Despite these measures to counteract autonomy at council, there were still issues that have worked to disrupt the project. At the start of the project, there was an issue with IT as they had originally been given the mandate to put in a new system. When the project manager suggested that they needed to examine SAP and work out what they needed from asset management first, this effectively put IT on the backburner while the organisation worked out what they wanted. Indeed, this created a lot of internal conflict as to who exactly was in charge of the asset management project as IT wanted to get started straight away while the PM wanted to wait while the business worked out what they needed.

During the project there was also a conflict over the priority of resources available. For example, the SAP used the same resources as another major project that was happening at the same time and there was no guidance around which project had priority. As such, the SAP project was delayed while the small SAP team at council worked on the other project. There was no overriding authority that could better prioritise these projects at that point in time. Management seemed to struggle with a lack of control over those under them in terms of prioritising resources while subordinates felt there was a lack of communication from management about what priorities were.

Finally, there were problems with the naming conventions applied to assets uploaded into SAP. The GIS staff did not have any knowledge of Park assets or the contracts between council and contractors. Instead, GIS staff went and loaded the assets and applied their own naming conventions without consulting the applicable business units about what they might want. They also ignored requests from these units to try and verify this information as it was being captured. Then, once it was finished, it was presented as being full and final with no further opportunity to change or review the data. This left many assets with names and descriptions that did not help anyone viewing those assets in SAP identify what they were and made it difficult to find assets of interest. For instance, a park may have 20 rubbish bins and a contract manager would have to look at the photos of all 20 bins to actually identify the bin they were interested in. There have also been problems with boundaries and how they join other assets with parkland areas being captured as assets and a variety of other problems due to this as well. This created a major issue for staff using the system and there were consistent complaints from them about SAP.

Concentration of processes versus autonomous processes

Looking deeper into this dialectic, there was also a struggle between the need to concentrate processes and the conflict with business units that were reluctant to let their processes go. This began, with business units having to adopt the new, agreed upon, versions of International Asset Management Standards (IAMS) that would replace how they already managed assets. This was because all the assets had been managed in very disjointed ways by different people and for different purposes. There was no combined view of how all these assets should be managed before the SAP project. For example, Parks had a lot of roading assets, such as car parks and access roads, which were not being managed in a way that the Transport department would consider as being up to standard for what sealed

surfaces should be. This example was quite common where an asset was being managed poorly, and outside the responsibility of another department, who were experts in managing that asset. The adoption of IAMS at council centralised all these different standards into one set, which can be used across council to provide a combined, concentrated, view of assets.

In addition to the change in asset management standards, there have also been considerable changes in business processes related to asset management and other activities centralised into SAP. The project has introduced SAP as a single asset management system that all departments can use. However, this has replaced a variety of different systems for handling assets throughout the organisation. City water and waste had been using the standard asset management module in SAP for more than six years before the implementation while Property used SAP as a device to manage maintenance. Other departments used their own systems which were tailored to their own needs. In Parks they had used a software based system but this had been abandoned by many staff because it was so unmanageable in how it was configured and generally unusable for what it was needed for. As such, many staff had moved to the use of their own spread-sheets and databases to look after their assets. The problem was that these autonomous processes were not easily shared with others, they were not using common standards, and there was little transparency in who owned what assets. Even when a common standard was used, it was often used in different ways. For instance, Finance would manage the main work breakdown structure (WBS) which would detail all the operational codes for different activities, but each of the business units would be left to their own devices to coordinate the work side of it and how it was actually used.

Historically, the development of such systems was often done to serve a particular purpose. For instance, someone might decide that they needed to map all the irrigation in parks and record the condition of the assets. When these projects began there was almost no consideration of looking at these assets in a wider context and doing everything together because of the lack of centralised control over different departments at council. The SAP project has meant that many of these autonomous processes have now been replaced by centralised, SAP processes to support the system. During the project, many of these processes were discussed, incorporated and consolidated into processes that could be used by all. Having worked out these processes, the next step was to encourage staff to start using the SAP to take advantage of the centralisation that had occurred and the process changes they had agreed on.

Well, a lot of it (existing Parks systems) actually are not systems. It's just a spreadsheet here and a database there that a contract manager will have and another contract manager will have another spreadsheet and database that's doing what he wants to do, he's got faith in it. And it's [the project manager] really saying to him, now that it's SAP) been operating for a while, have a look in there. You can do it this way, all the information you are gathering on this spreadsheet is actually being gathered in here too, so you know, let go. (Project member)

Staff have been strongly encouraged to take up SAP, especially as they were involved in defining the requirements for it and they have the system functionality they wanted. Of course there has been resistance from staff to using the new system because it replaces their old systems and some processes take longer to do than before. This has resulted in a struggle as staff resist the centralisation of processes that has occurred. In response, pressure has been applied to staff and some contract managers were even coerced into using the system as it has become an essential part of their jobs. Further, one staff member from Asset management was assigned to monitor staff use of the system. This involved ensuring that staff adhered to the business rules necessary, for example utilising the correct damage and cause codes and also selecting the correct maintenance activity types of assets. This policing has been effective when staff knew they were being checked, but during periods when the 'policeman' has been away, compliance has slipped. There has also been increasing pressure applied to unit managers in charge of non-compliant staff to ensure that staff correctly use the system, and that its use becomes part of their performance evaluations. However, Asset management does not have the authority to force this issue and in some cases this has been blocked by managers who do not see system compliance as being a major issue for their staff.

Consequence

So the struggles between the existing autonomy at council, and the required centralisation needed to support SAP, have had a variety of impacts on the project. These included disruptions to the project including the GIS mapping of assets, priority of competing projects and differences between IT and the PM. This has also manifested itself in a resistance to change amongst some staff. Departments and staff were both used to doing their own thing and they were not happy about outside forces telling them what to do. Indeed, there were a number of times during the project that the steering board had to apply significant pressure

to particular business units to push the project on. There was also a lot of internal, political wrangling between business units because they were reshaping the power and control that existed within the organisation and there were tensions due to that process. As such the project manager needed to exert control and side-line certain issues that were not important to the primary goal of Go Live.

I think that was a learning that did come out of it (project implementation) was that a lot of people were looking for how can we break the system rather than how can we make it work. If you were not careful you could spend a significant amount of time talking about minor issues which, really, what we do now is just shelve them. (Project member)

Often this was because there were so many different ways of doing something and they had to consider all those different viewpoints to make the process work. For instance, with reporting on assets they could do it by 'intersection to intersection', or 'road by road', or by 'street block.' Each would have their own advantages and disadvantages and they would have to try and work out something that everybody was happy with. Often, it was difficult for groups to make such decisions and the project team had to make it for them.

Finance also had a hard time making some of those big decisions and the project manager had to go and immerse himself in that department to try and sort the issues out. Thus, many of these issues threatened to derail the project because staff did not want to give up power and control and could not agree on how processes would change. Often this was because staff felt vulnerable if they were giving up responsibility within the organisation as part of the change.

In terms of processes, the consequence of the struggle between autonomy and centralisation has involved the need to more strictly monitor and enforce staff use of SAP. Indeed monitoring has been an effective tool to ensure staff use the system as they should. In fact, Asset management were able to increase compliance from about 30% to almost 80% of system use through policing. Further, when staff use the system there is an audit trail of use which can be followed by Asset management. This has increased accountability because staff activities in the system can be monitored and this provides a trail for regulators to assess how well assets are being managed. Accountability and decision making improved as a result of the centralisation and monitoring that now occurs. The result of these struggles,

and the increase in centralisation, was likely to have moved the SCC away from being as autonomous as it once was. The SAP and its centralised processes have helped break down some of the walls between organisational units at the SCC and staff were starting to realise a common aim.

I think now you've got a single organisation pulling together. I think prior to that you had a whole heap of people with the aspiration of being a single organisation and a desire to be it. But they let their little empires put up walls around them. And there was always a deep suspicion of what the asset management project was always going to be about. I think a bit of the big brother was in there as well. (Project member)

People have begun to see the benefits of what SAP can deliver and there is an increased desire to have the system implemented throughout the council. Even in Parks, which was an area that was reasonably siloed, there has been more of a commitment to doing things better and to embrace the change that has happened.

4.4.1.2 Hard data versus personal experience

The basis of truth and rationality considers whether the organisation seeks truth through systematic study using hard data or through personal experience and intuition. In this section we consider the conflict between the organisation and forces within the implementation promoting an orientation towards hard data.

Hard data versus personal experience across the project

A hard data orientation was likely to be valuable when implementing SAP because SAP itself favours a centralised store of codified data which can be used by all. It was a system where knowledge was captured and housed within a single database and relied on processes for users to capture and use this data. There was evidence from the case study to suggest that the SCC was oriented towards the use of personal experience and this was seen in many aspects of current practice which created struggles for the implementation. First of all, the initial investigations into the state of asset management at the SCC were conducted by interviewing staff about their experiences with asset management and what they did. The purpose was to identify how the system worked and what the issues were because it was important to assess the experience of staff in the organisation. Once there was a commitment to investigate ERP for council, those involved began investigating the different

systems they were familiar. There was not any attempt to research new systems or arrive upon a process for selecting something unknown.

Once the project was underway, staff were selected to be on the project by managers who knew they would be able to help. Further, the project manager selected the operational board by identifying those who managed assets, and those who held influence over assets, and making sure they were involved. Subject matter experts (SMEs's) were selected in a similar fashion from those who showed enthusiasm for the project. Indeed, some of the SME's became more involved in the project when it was found that they had asset management experience and training during their involvement. This reflected the importance of personal relationships and networks within the SCC where people were found based on the recommendations of others. During the project, forums were regularly held to discuss what the project team was doing with groups of staff who were interested. Often, these would be attended by top management who would be on hand to lend their support to the project. There were also opportunities to discuss with staff about what was going on and to gain feedback from them about what was happening. Staff would also discuss the project in their meetings with peers which provided further opportunities for feedback into the project.

So, on the project overall, the SCC has tended to be more oriented towards personal experience. This smoothed the implementation in some areas, but also hindered it, as the next section shows, where there was conflict between these values.

Standardisation of data versus experience of assets

The introduction of SAP changed the work practices of contract managers and other parks staff, and created conflict as there was a clash of opposing values. Prior to the implementation, contract managers used to do a lot of their work in a very reactive fashion based on personal experience. For instance, someone would ring up about a problem with an asset and the contract manager would arrange to get it fixed. If the same issues were continually occurring, it was only by drawing on the experience of the contract manager that one could determine if there was an ongoing problem that needed to be rectified. For example, the contract manager might remember that they had already fixed the asset a few times, so perhaps there was an issue with vandalism such that the asset would need to be replaced with something stronger or removed entirely if it was not needed or not economical to maintain. Similarly, there could be a defect with a particular asset, signifying a

larger problem that needed to be addressed whether for that particular asset or across the board for that set of assets.

I think we relied more on being in the position for a long period of time and knowing that, this fountain is coming up all the time. Or this issue is coming up all the time, I'd better stop and have a look what is happening. Which is what I'd do for an ornamental fountain if I thought, "sounds like I'm replacing the pump here quite regularly," I could check back or by sight and just drill through all the requests for that site and find it, how many times it had been replaced and over what period of time just to see. (Contract manager)

If contract managers suspected there was a problem, they had to rummage through all the past work orders for that asset, or through the Worksmart records, to determine the history of the asset. In other words, problem recognition relied solely on the personal experience of staff. This was how contract managers worked and it relied on them being familiar with their assets and being in their positions long enough to have built up that asset knowledge. The SAP enhancement introduced change as staff now used an integrated system with standards for each asset. The standardisation of asset types, due to IAMS, also meant that different assets could be compared across council which could improve the maintenance of them all. Staff could set priorities for the importance of assets and have better control of what they were spending their money on. The project also meant that data was much more valuable because they have created a single database that could be used by all staff. For instance, instead of having assets for a park recorded in Parks, and roading assets in Parks recorded in Transport, there was now one database that recorded everything.

The SAP project meant a change in how contract managers needed to work. Instead of setting work orders to a particular park, they now had to link each work order to the assets being worked on. This made it much easier to identify problems with particular assets because they were not being lost within a single work order set at the park level. In addition, the system also required cost and damage codes which could be analysed to work out what was going on with the asset. Contract managers could also use the system to examine similar assets to see if these problems were occurring there too. For instance, a particular water pump may be regularly failing and by looking at the same pumps used elsewhere, they could determine if it was a problem with that pump, or whether there were particular features with how it was being used that was causing the problem. Thus, they might have

needed to change the pipe design leading into the pump or make other changes to get the best use from it. They could also use the system to identify areas where the contractor was not providing 'value for money.' For instance, a contractor may have patched up the bearings on a swing over a 6 month period when it would have made more sense for them to replace the bearings entirely. Thus, they could identify cases where they could have spent a bit more and replace things rather than engaging in repetitive ongoing maintenance that was not providing value for money.

This has been a major change for contract managers and acceptance was mixed. Some have struggled to become more data oriented while others have embraced the benefits this had for their work. Staff that struggled often failed to rigorously assign work orders to assets which was one of the main issues that was affecting system benefits. If assets did not have work orders linked to them, then it was difficult to build up an asset history which could be used for analysis and diagnosis. There were also problems with contract managers being able to generate the reports to analyse their assets. The reporting system in SAP was not easy to use and required the use, and understanding, of different codes to generate reports. Once someone was used to it, it was easy, but they have to learn the system, and appreciate how it worked, before they could do that.

They can figure out how to do it if they have the inclination. It is not that hard but because SAP works in coding's, rather than plain English; they have a natural adversity to it. Once you actually set them up and you save a report and you give it a plain English title and put it in the favourites, they use it over and over again and then once they get confident with it they start moving around and manipulating it when you show them. But, there is an aversion to them doing that and from the Parks departments viewpoint I think they did not think that us contract managers are supposed to do the job to do reports on the assets that they own. (Asset management team member)

Contract managers themselves argued that they were not proficient enough in the system because they did not use it enough. Instead, there was some expectation that others should have generated these reports for them, while Asset management, who oversaw the contract managers, had the opposite view. This showed evidence of a dialectic clash between the different organisational groups in the SCC. The contract managers were oriented towards personal experience and had resisted the SAP and its hard data orientation. In contrast, Asset management, who provided the overall supervision of assets, appeared to be more

hard data oriented as a result of being in the position of monitoring asset data. This was the group that previously had to tidy up all the work orders from contract managers to identify how money was being spent in order to comply with external regulations. They worked with asset data every day and were among the first to see the value of tracking asset data within SAP, and the benefits that it had, to diagnose problems and plan for asset maintenance and renewals. Thus, there was a cultural difference in the importance assigned to data from both groups. This was shown in the following quotes, where Asset management staff complained about the failure of contract managers to assign work orders to assets and the mind-set change that they needed to have made.

You know, it is things like that they want to be able to, so that they can then change their capital program to say actually “we will put this type of asset in, it might cost more initially but it will last longer,” or vice versa “we will put this one in, it does not cost us much, by the time we replace it 20 times it is the same as if we put in a really expensive one,” so it is so they can do that analysis. But until we get the operational units to start pushing the costs, the actual jobs, to those lower levels, that is going to be difficult. So, it’s an education process. (Asset management team member)

The system gives us the ability to capture all the information, how many things are failing. Before that, from the Parks side, there is no such various system, everything is based on “I think it is,” or “my gut-feeling is that this batch is not right.” That type of feeling. But with the system you have more black and white record of what is going on. (Asset management team member)

As many contract managers still did not see the value of this, there was a problem with the use of the whole system because it relied on the matching of work orders to specific assets. There was then an ongoing tension between Parks and Asset management over the maintenance of those assets and their use of the system. Asset management understood the system and appreciated the benefits that it could deliver for them in being able to aid prediction and analysis. As such, they were pushing for more compliance from Parks in how they used the system to ensure that this information was captured. Parks, on the other hand, do not appear to have the understanding that Asset management did. As such, they were frustrated with the extra reporting they needed to do for assets and felt that it was a waste of time for them.

Consequence

The SAP enhancement created a struggle between the cultural values concerning the basis of knowledge within the organisation. SAP supported a hard data orientation, seen here in the way that data was recorded and could be used to diagnose and analyse the use of assets at council. This conflicted with the working styles of contract managers where they were used to using their own personal knowledge and experience to diagnose problems. The need to report more fully on assets created conflict with many contract managers who did not understand the importance of what they needed to do because it did not relate to how they worked. Thus, groups with an orientation towards personal experience struggled with the newfound importance placed on data. The evidence also showed that there was a diversity of values on this cultural value that affected how groups adopted to the new system. Where there were opposing values, there were tensions, and this played out across the implementation.

4.4.1.3 Results versus process

The last cultural value that had a strong impact on the SAP enhancement concerned the struggle between results and process orientation. This was conflict between those who felt the end product was important and those who believed the methods used to reach the end product was just as important as the result itself. The SCC was an organisation where there were groups that valued this differently and there was some conflict between those groups as a result. So, this struggle is investigated in two parts, the first examines the general conflict between process and results, while the second examines the change in working style for contract managers.

The SCC's results orientation versus the need for processes in SAP

The SCC was an organisation where there was a mixture of process and results orientation across the different units that were involved in the implementation. Asset management (AM) tended to be those in charge of running the project and were also the staff which held the overall responsibility of assets throughout council. AM tended to have more of a process orientation, which was indicative of the engineering staff who predominantly made up the unit. AM worked closely with the operational teams to manage their assets and to provide technical advice as needed and they were used to having systems and processes in place for the management of assets.

Parks, on the other hand, were more results oriented which suited their work practice of going out and fixing problems. For instance, in the past there were examples where Parks would go out and build different assets to meet different needs, without ever being super accurate with how much it was costing council, or considering whether working with other units might have led to better outcomes. Then, at the end of each financial year, Finance would attempt to chase down where all the money had been spent, for external compliance, and it was always difficult to gather this information together to show what had been done. Things were done to meet needs and wants at any particular time and there was not much consideration to the process involved. This carried into the project at different points. For instance, during the requirements process, the Parks staff involved were made aware of what the implications would be of the requirements they were drawing together and the choices they were making. AM staff, leading those discussions, felt that it was important that the Parks staff had this understanding and that if they asked for 20 different items to be completed for a particular task then it might be them who would actually need to have completed it. In other words, while it might have been nice to have that information, it would lead to more work down the road that somebody else would have had to deal with.

So I do not think Parks quite made the connection between what they were asking for and how that would relate when they got their system. Because they said yes we want it right down low, we want to be able to record jobs right down at this low level. Within a week, they said “oh, I want to allocate jobs for all of my contract area,” well actually that is not what you asked for. You said this is what you wanted and this why you said you wanted it, “oh, but that means I have to do lots of different work orders,” “yes that does, we tried telling you that when you asked for that.” (Project member)

This showed the differences between these units, where Parks did not have the same understanding of processes that AM had. Hence the need for AM staff to feel that they needed to make Parks staff aware of the implications of what they were doing in requirements. There were also examples of conflict between these groups and the project which is shown next.

The change in working style for contract managers

Contract managers were one group in Council that had a results orientation. In part, this was due to how they had worked in the past, where they used a ‘fire-fighting’ style approach to sort out problems as they came in. Thus, it was difficult for contract managers to orient

more towards being proactive in trying to sort out issues before they became problems. This was not helped by local governance bodies and community groups who would want various things attended to almost immediately once requested. As such, contract managers tended to be very results oriented and this was also shown through their relationship with contractors. Many of the contract managers also had a very informal relationship with the contractors, as many of the contractors had once been council staff themselves. It was often easier for contract managers to report problems directly to the contractor than to go through the process of doing a formal written request which would otherwise be needed to get the problem sorted.

I think with other more formal contractors, if you are out on site and actually saw something that was required (e.g. a repair needing to be done) [we would get it done]. I know with the roading guys they actually have to go through a formal written request process to get something to happen, whereas because we have that more informal relationship ... we can actually ring up and go: "look, let's do the paperwork at another time and another date. Can you just make this happen," and there's a lot of that [that happens]. (Contract manager)

As such, contract managers were very results oriented and liked to get work done. The contract managers argued that this was justified because they did not have the technology in the field to be able to make that formal request when it was needed. Otherwise, if there was work that needed to be done urgently then the contract manager would have to race back to the office to make the request which was not always practical when these staff serviced quite large areas of parks. Contract managers also managed contractors based on the use of key performance indicators (KPI's) that were set as part of the contract. These KPI's were in turn matched against the annual plan which listed the levels of service that council promised the general public. So, in Parks this meant that the grass would be cut regularly and had to be below a given height, or that toilets would be cleaned a minimum of twice per week. Contract managers would then monitor how well contractors met those KPI's and ask them to report on those, while also tracking their performance through their own internal audit process.

The SAP project meant changes to how contract managers worked as they had to shift to a more process oriented approach. This meant the introduction of new processes to Parks and the consolidation of others. For instance, before the implementation, there were four major

contractors, four contracts and four different ways of issuing directions between them all. Now, these have been reengineered so that there was only one process that could be used for all contractors. Contract managers had to change the way they worked with the system, and attend to new processes, because this was important in SAP if the long term value of asset management was to be realised. It was not enough to just get the asset fixed, it must also be recorded properly so that the history of the asset could be developed over time. This involved not just capturing all the work done by contractors on assets, but also the financials related to the assets, so the actual costs of managing those would be available to managers. All of this information could then help contract managers' change to becoming more proactive in how they worked as they could anticipate problems ahead of time based on the data available.

The mind-set of fire fighting has to be changed to more of a plan approach of management. So that is the start really. The start of change. That takes some time, that takes about a year just to get the mind-set change. (Asset management team member)

This also provided processes by which contract managers could better manage contractors. They could see the history of each asset and what was done to it, and query contractors about the service they were providing. For instance, the processing time for work requests each month dropped from one week to a couple of hours because the contract manager was approving those requests as they came in. As such, there was a lot more control given to the contract manager to manage their contracts on a day to day basis. The downside though, was that some managers saw this as more work that needed to be done without appreciating the benefits of such processes which allowed them more control.

The change in working styles did not just affect the contract managers, but also the rural rangers too. Rural rangers were those who effectively did the job of both contract managers and contractors in parks outside the city. For these staff, they went from completing a simple timesheet for work undertaken, to having to log their work to particular assets, locations and timeframes. As with the contractors in the city, this was necessary to capture the ongoing work on all assets to build up a history of what was going on with each asset. AM needed to know how the rangers were spending their time in order to assess what assets they would renew and to provide information for decisions around improvements, or reductions, in maintenance budgets for those different rural parks.

It was not easy for contract managers to adjust to a process orientation, and this was not helped by errors in the system, or incomplete processes which still rely on the use of the legacy system. Sometimes errors that occurred were due to staff using both the legacy systems and SAP together. For instance, one contract manager complained of having to go into SAP to approve work requests that had been created in Worksmart which was their legacy work management system.

Some staff still used Worksmart because they wanted to ensure that the Worksmart system was updated, so that if someone else called about the same problem then they could see that it was already being dealt with. The SAP did not auto-update the Worksmart system effectively and staff were never sure if entering information in SAP would automatically update Worksmart as it would if they used Worksmart directly. It was also a lot more cumbersome to use SAP to do asset management because they had more details to complete and they had to do the authorisations for work orders on a daily basis. This provided the contract managers with more control, but at the expense of a longer process than what happened before.

I think when you are pushed for time, it is a whole lot easier just to draw up a purchase order then it is to draw up a notification and a works order and then assign that to a purchase order. So that is the other thing is the length of time it takes to do that. What else do I not like about it? I think that is really the key things that annoys me about it.
(Contract manager)

As such, there have been attempts to shortcut the system which was indicative of the resistance to new processes. A good example of this, reported widely, were contract managers who logged work orders to parks when they should have been setting those work orders to individual assets instead. Similarly, they may have created a standing order for a whole year of maintenance for a park without setting up individual work orders as needed. These workarounds circumvented the need to detail what those work orders were for and were much faster to do, but which failed entirely in the processes setup to manage assets and to provide the information needed in the future. To date, it was reported that there was not enough policing of contract manager compliance in their use of the system. AM monitored this, but so far they had not been able to convince Parks to more strictly monitor staff's use of the system. Instead, it seemed a case of the Parks manager not treating these process lapses as a priority and the contract managers getting away with it in many cases.

Consequence

The SAP project meant a move to more process orientation at council. This was seen with both contract managers and IT becoming more process oriented in order to improve their performance. In particular, for contract managers this meant a change from running around putting out fires, to a more planned, proactive approach which was difficult for many managers to adjust to. Contract managers had to change their mind-set to cope with SAP because these processes were necessary to provide the information needed for asset management. Examples of this struggle included contract managers not setting work orders to individual assets, continued use of legacy systems and problems with contractors getting work done. Efforts were also made to encourage system use including the use of a 'policeman' to monitor performance and initiatives to link use to contracts so that there were real penalties for non-compliance. These have served to increase the process orientation of staff at council.

4.4.2 Other dimensions

Here, the remaining five dimensions from this case study are briefly outlined. These are dimensions where there were either minor struggles within the dialectic or little or no evidence of struggles. In these cases, this could indicate a balance between opposing forces or alignment between the values of the ES and the organisation.

4.4.2.1 Stability versus change

In this dimension we examine the values of stability and change to determine what effect these had on the SAP enhancement. Both of these values were found in the enhancement with tensions and conflict evident.

Within the SCC there was an orientation towards stability. Many staff within the council had a "this is how we used to do it," mentality where work was done the same as they had in the past and change was bad. In part, this was due to the long tenures at the SCC. Often this resistance was due to a fear of trying something new which translated into an organisation with had a lot of inbuilt inertia to change. A substantial portion of staff were also not very computer or technology literate. So that staff preferred the current systems because they were not computer based and change to SAP meant they would now be using computers more in their jobs. This was particularly common in Parks where staff were more used to running a machine than a computer.

The SCC had begun to change over the past few years as new staff have come in and challenged the 'old ways.' The SAP project strengthened these forces for change and a goal of the project was to introduce a continuous improvement plan that would make change a constant at council. The idea was to continue developing asset management from basic to advanced levels. In addition to this, there was active change management as the project manager was wary of the need for people to embrace SAP and to help rollout the system to other areas. This involved providing lots of opportunities for staff input into the system and making sure staff understood the need for why the system was changing. Project staff, were also encouraged to go back and discuss what they were doing with staff not involved with the project and to collect their input back into the project.

There was inbuilt resistance to new processes at SCC because staff were used to their own databases and ways of managing assets. SAP was not a user-friendly system, and there was no budget available to customise the clunky interface to make it easier for staff to use. It was also more difficult for staff to generate their own reports so that it was not uncommon for staff to continue using their existing systems because they could generate what they needed from them. This did nothing to encourage switchover to SAP as the existing systems were retained and staff continued using them for much of what they needed to do. There were also problems with the B2B after Go Live which meant that staff had to switch back to their old systems to get their work done while the system was repaired.

Opposing these stability forces were forces supporting change such as the change management program to train staff in SAP. Some of the training was led by SME's who could take knowledge back to each area of Parks and help their workmates learn the system. This was helpful for staff who were struggling with the new system and provided staff close by who could encourage them. There was also some degree of acceptance towards SAP as staff became familiar with it. The benefits of the system also motivated users which helped them accept the system even when it was running poorly during the implementation stage.

Consequence

During the project, the project manager sought to counter resistance by identifying those who were opposed to the system. Resistance occurred from staff unwilling to change to new processes and a new system. Some still used the Worksmart system when they should have been using SAP, while others used SAP but tried to shortcut the processes involved.

However, SAP use became a necessary part of many workers jobs although it was better if they were willing users of the system which prompted efforts to coach staff to change. The ongoing consequence of these dialectic forces was that the organisation became more change oriented. This was perhaps not surprising given that an organisation used to stability was more ready for change after having experienced major change. Staff also commented that there were improvements since the SAP project was launched and that this had contributed towards a greater organisational desire for change and improvement.

4.4.2.2 Isolation versus collaboration

In this dimension the struggle between the isolationist tendencies of departments versus forces for collaboration within the project are examined. This found that there were tensions as a result of conflicts between these two different cultural values but no evidence that this resulted in cultural change.

Before SAP, the SCC was very siloed as departments preferred to work alone rather than collaborate with others. For instance, Parks was in charge of the ongoing maintenance of parks assets but a variety of different groups could also purchase assets for Parks, often with little or no consideration of Parks and how these new assets would be maintained in the future. As such, there was no continuation of care between departments and a 'job done' attitude prevailed. This affected planning too, where one unit would go off on a project which would be better served with a wider scope and more involvement from other units. On the project, this go it alone attitude was also evident. The mapping of GIS assets provided one example where GIS staff loaded assets and applied naming conventions to Parks assets without consulting anyone in Parks about what they wanted. As such, this data was strewn with errors and the naming conventions made it very difficult for contract managers to use the system. IT also set themselves apart as they were unwilling to work with the project managers rollout plan instead favouring a different course of action.

In opposition to this isolationism, the project required a collaborative approach as staff must had to learn a single, integrated system. Collaboration was not an alien concept to council. Indeed, inter-unit collaboration did exist but tended to be based on the people involved, i.e. personal relationships, more than on an organisational desire to work together. The SCC could be characterised as a web of personal relationships where people could find out more about the wider organisation through the people they already knew. The project also brought people together, particularly during the requirements which required a

collaborative process to succeed. This could not have been done without different staff working together and also helped staff buy into the system which reduced resistance in the long term. The way that training was handled also sought to increase the interactions of staff with each other. The use of SME's meant that there was someone in each unit that could assist those who had problems with the system. Also, the movement to new offices allowed many units to work in the same building which also increased collaboration. The SAP enhancement also increased the need for collaboration with contractors. Since Go Live, Council was reliant on contractors to provide damage and cause codes on the work orders they were involved with so they knew what was going on with their assets. This showed how SAP increased the need for collaboration amongst those who shared the same data.

Consequence

The need for staff to work out what they needed in the pre-implementation stage meant that the project took longer to complete than first planned. However, it was important that staff collaborated together about what they wanted from the new system and to ensure they had a joint understanding of what asset management would mean to council. Where collaboration has not occurred, there has been less than optimal results with the GIS work being a good example of this. The SAP also encouraged more collaboration between staff and contractors who had a joint interest in maintaining the data in SAP. As a result, the isolationist, silo culture, at Council, caused problems with the need to collaborate in SAP. While there was evidence to suggest that collaboration increased at Council, and there was less of a silo culture than before, the evidence was not strong. As such, it is hard to argue in favour of any major cultural change as a result of the conflicts reported here.

4.4.2.3 External versus internal motivation

In this dimension we examine internal and external motivation to determine their impact on the SAP enhancement. For this dimension we found that although there was evidence for both cultural values, there were no tensions or conflict that impacted the enhancement.

Within the SCC, staff were not driven by deadlines as they might have been elsewhere and were instead more community focused. In contrast, SAP encouraged external motivation through a focus on data and deadlines. On the project, it was noted that when deadlines and target dates were set then there was a lot more productivity from staff. There was also more focus put on staff use of the SAP and a 'policeman' was brought in to monitor this use which could be easily done through SAP system reports.

SAP also encouraged external motivation through the use of change management tactics that highlighted prior SAP successes and made clear the benefits of the system. The support of fellow staff was also important to counter the negative information from outside the SCC about SAP. There was also a deliberate strategy to harness people who were positive about SAP and to use them as SME's who could influence others. Top management support was also invaluable as staff often did not know how important a project was until the general manager came in and talked to them about it.

Consequence

In terms of internal motivation, SAP helped staff do better in their jobs as there was less need for paperwork and signing off on documents and more time for planning. As such, it could help them better serve the needs of the community which was a primary motivation. On the other hand, there was an increase in external motivation in the form of controls and policing that was brought in to support SAP. AM had to ensure that contract managers were following the agreed upon processes and ensure compliance. However, looking at the influence of both internal and external motivation on the project, there was little evidence of struggle between these dialectic values with both forces acting in a complementary fashion.

4.4.2.4 Internal versus external change

In this dimension, we examine evidence for both internal and external change and determine what impact that had on the implementation. There were both internal and external drivers for SAP evident but no evidence of any conflict between them.

Prior attempts to introduce an assets system at Parks had failed for various reasons because of a lack of corporate support, problems with IT or because the system was rejected by staff. Thus, there remained a strong internal need for an asset management system to replace the disparity of systems used already. Further, because staff used unique systems, these could not be compared together or aligned to corporate reporting. This also meant that IT had to support all these different systems and platforms upon which they ran. For instance, in Parks there were a variety of different databases which contained between 700 and 1,700 different parks so there was little consensus around how to define a park let alone the myriad of other assets that Parks managed.

In contrast to internal drivers, there were also very real external drivers in the form of government legislation and community needs. The enthusiasm by council executives towards asset management was in part due to the external pressures they were facing to meet those needs. As a public authority, the SCC had to provide good stewardship of assets they held for the general public and SAP could better manage those assets and reduce costs. Operationally, there was also pressure from the community to get things fixed as it was easy for someone to report a problem, but much harder to work out if the problem had been resolved or not until they got the bill from the contractor. Thus, there was pressure from the community arising from the need for systems that would better report what was going on operationally to both council and the community.

Consequence

So, there was evidence of both internal and external values across the SAP enhancement. Externally, it was important for the council to meet the necessary legal obligations from the government which was an important driver for this stage. Lower down the organisation, operational realities and the mishmash of asset systems employed was likely to have been more of a driver for staff. Thus, both external and internal pressures helped drive the SAP enhancement so there was not really any conflict between them as there was a clearly identifiable need for a new system to address these problems.

4.4.2.5 Short term versus long term

In the final dimension, we look for evidence of short term and long term values across the SAP enhancement to consider their impact. We find that although there was evidence for both values, there was no conflict or tensions between them.

The SCC had more of a long term orientation because they worked against 10 year plans developed in consultation with the community. SAP fit this orientation well because the planning would provide the basis for how assets could be managed into the future. During the project itself, there was more of a short term orientation due to the pressures of time and cost budgets that needed to be met. The project manager had very rigid timeframes and was hard on anything that was likely to slow the project down. For instance, the B2B interface was setup but there was no time to adequately test the system with the result that status and failure codes did not sync as they should after Go Live.

The project team were also keen to avoid getting bogged down in issues that might delay the project. For instance, the integration of the SAP and GIS was put off until after Go Live but meant that assets lacked any location data and meant users had to reference both systems. A further issue was the import of assets which could not be completed for Go Live. This created problems for staff because assets were not in the system so they would have to turn to legacy systems to get the information they needed. The short term orientation of the project team also meant they would ignore problems with the system in favour of completing the next implementation stage. However, some of the issues raised were quite valid so that fixing them in the future would require retrospective actions that would just increase costs more than if they had been attended to when they arose.

Consequences

So, the council tended to favour a long term orientation which was a result of the need to provide service to the community now and into the future. There was recognition that even though the assets system would be expensive that there would be a payback into the future. This long term orientation contrasted with the short term orientation of the project which was necessary to provide some impetus to the project and prevent costs ballooning. This was perhaps taken too far on the project as there were examples of decisions made that had short term benefits but at the expense of increased costs in the long term. This included tasks like the lack of B2B testing, the incomplete asset transfer and the incomplete work around human processes. However, there was little evidence that this created conflict during the enhancement and it was likely that the project served to strengthen the long term orientation at council because the assets system provided staff with tools to enable better planning of assets into the future.

4.4.3 Summary

In summary, the results from this case study showed how culture could affect the implementation of enterprise systems in organisations. In this thesis, three different dialectic conflicts were examined which showed the tensions that could originate when there were mismatches between elements of the organisational culture and those of the ES project itself. The autonomy that existed within the council meant that it was important that business units were brought together onto boards that could collectively agree what they needed to do. Autonomy was also seen to impact upon the prioritisation of resources, communication of priorities, cooperation of IT and the data collection. The main dialectic

struggle that occurred was due to the need for the organisation to become more centralised as processes were concentrated to support SAP. This was seen in the project as units failed to agree on proposed changes and served to lengthen the implementation as discussions dragged on. Once implemented, staff struggled to use the new system and accept the changes they had agreed to.

Within the organisation, business units valued data differently and this helped or hindered the project. Primarily, personal experience was favoured and this smoothed the implementation in some cases. For instance, staff were selected based on the recommendations of managers while forums were regularly held to collect feedback from staff. AM was one group which was more accepting of SAP because they shared similar values which matched how they worked. Where groups held different cultural values with the SAP project, there was conflict. The main example of this was contract managers, who favoured personal experience which was important in deducing problems in their work. Contract managers have had problems in using SAP because they struggled with the newfound importance placed on data and the need to enter information and generate reports from computers in order to do their work. This translated into their misuse of the system and attempts to shortcut the system to avoid the required data entry that the system needed.

Lastly, there was a mixture of value orientations within the SCC regarding the importance placed on process over results. The SAP project favoured a process orientation because processes were important in ensuring the system worked as expected. This played out in different ways across the implementation depending on the match of values with business units. AM were one group that already favoured a process orientation because of the engineering focus within their work. In contrast, contract managers struggled, as they had a results oriented culture which matched their work process of fixing problems as they were reported. As such, contract managers struggled in their use of SAP and the need to attend to required processes, and assign work orders appropriately. This was important if the full benefits of SAP and asset management were to be realised by the SCC. Thus, this mismatch in cultural values played out in their misuse of SAP.

So, this section examined four case studies individually and identified a number of important dimensions within each case where there were tensions evident between opposing dialectic

values. Next, these cases are considered together as the key dimensions across all cases are examined to determine what the aggregate findings from this thesis are.

4.5 Cross-case Analysis

In this section, we examine cultural dimensions across all four case studies with the purpose of arriving upon a set of dimensions which were important in affecting ES implementations. The focus is on identifying cross-case patterns, or contrasts, that can shed light on the generalisability of the findings from each case. The identification of a pattern of values can provide evidence to answer the research question of how organisational culture affects ES implementation. This can show contradictory cultural values where cultural transformation occurred or complementary values where there was cultural persistence (Robey & Azevedo, 1994). This cross-case analysis also includes a post-hoc analysis examining evidence of customisations and configurations that were conducted in each case to lessen the changes that the organisation would otherwise have faced.

So far, the single case study analysis came up with two to three key dimensions for each case where there was strong evidence of struggles that affected each ES implementation. These findings are summarised in the following table.

Table 4.5 - Key cultural dimensions from each individual case study

Dimension	Case 1 (SU)	Case 2 (SAHB)	Case 3 (FoodCo)	Case 4 (SCC)
1. Orientation to change (stability vs. change)	X	-	x	x
2. Control, coordination and responsibility (concentration vs. autonomy)	X	X	X	X
3. Orientation to collaboration (isolation vs. collaboration)	x	-	X	x
4. Basis of truth and rationality (hard data vs. personal experience)	-	-	-	X
5. Motivation (external vs. internal)	-	-	-	-
6. Orientation to work (process vs. results)	-	X	X	X
7. Orientation and focus (internal vs. external)	X	-	x	-
8. Nature of time horizon (short term vs. long term)	-	-	-	-

KEY: **X** = Evidence of strong conflict

x = Evidence of moderate conflict

Dash (-) = No evidence of tensions (or weak evidence)

In the table, a bold **X** represented a dimension within a case study where there was strong conflict evident. A small x denoted a case where there was moderate conflict or tensions evident. Finally, a dash (-), showed that there was a lack of evidence of tensions such that the cultural dimension or cultural values were complementary to the implementation. In the following tables (i.e. Tables 4.6 to 4.11), the shaded column signifies cases with strong conflict and a blank column represents a case where there was no conflict evident. So, we next examine each cultural dimension to identify patterns and contrasts between each case to analyse the cultural conflicts that were evident.

4.5.1 Stability versus change

In this dimension, we examine the identity, struggles and consequence of conflict across all case studies to determine what patterns and contrasts existed between these cases. The SU case had conflicts that were evident while the FoodCo and SCC cases had more moderate conflicts evident. In the SAHB case there was no evidence of any dialectic tensions. So, in this section we principally compare the SU case with FoodCo and SCC to see what similarities or differences existed between them in terms of conflict. The following table summarises these results.

Table 4.6 - Cross-case results for Orientation to change

Case	Case 1 (SU)	Case 2 (SAHB)	Case 3 (FoodCo)	Case 4 (SCC)
Identity	The university had been run in a settled fashion for many years and staff were unprepared for major change.	-	FoodCo was stability oriented and staff were not used to change or prepared for coming change.	Staff worked in the same way they had before and were not receptive to new ideas because they were afraid of change and feared "breaking the system".
Struggles	Staff were used to being insulated from change and were not prepared to become engaged in the change process or being involved in decision making. Staff wanted to retain current processes and did not want to learn something new or have changes in their responsibilities.	-	Staff had long tenures and had not been exposed to major change before. Staff struggled with converting their long-held processes into SAP because they did not understand why they did it. They did not want to change to learn a new system.	Staff have begun to be challenged by new ideas from people entering the organisation. Staff used their own systems because they worked the way they wanted and resisted new systems if they did not meet existing needs.
Subcultures	-	-	-	Contract managers versus Asset Management
Consequence	Some staff resisted the change to new processes, responsibilities and systems but others accepting it as they recognised the problems with the old system. Overall, the university has become more change oriented as staff are now more prepared, and involved, in change.	-	Management forced change and meant some staff could not cope while others could see the benefits. Staff have become more change oriented evidenced by the desire to add new functionality and challenge the status quo of other systems used at FoodCo.	Staff resisted the new system and processes which limited system benefits and meant more control was needed. As staff were exposed to change they have become more change oriented as there is more openness about new ideas and ways of working.

KEY: Shaded column = Strong conflict.

Non-shaded column = Moderate conflict.

Blank column = No evidence or Weak evidence of conflict.

All three cases shared similarities in the identities of the struggles in each case. Each case was characterised by having a very stable culture where staff were not used to change so it was perhaps not surprising that this formed the basis of tensions when staff suddenly needed to change many aspects of their work. In the SCC case, staff followed the same way of working and were afraid of new ideas and the experimentation needed to try new ways. The FoodCo case was similar as staff had established patterns of working and had often forgotten the reasons why they worked in particular ways. In contrast to the other cases, SU was perhaps the most extreme case because the university had a deliberate strategy of minimising changes for academic staff so they could focus on the key deliverables of

teaching and research. This perhaps explained why academic staff at SU had the most problems because they were used to stability and not to the uncertainty of regular change. Overall, all three case studies had cultural values that were incompatible with the changes needed to support the implementation of new ES and which created tensions for these projects.

The struggles that resulted were quite similar across each case study. Staff in all three organisations tended to have quite long tenures so they were very set in the ways they worked within the organisation. All three organisations had also gone through long periods of stability where staff had not had to undergo major change so they were unfamiliar with how to manage change and how to adjust to new ways of working. Staff also preferred to retain existing ways of working, and were distrustful and resistant to the idea of moving to new processes and the changes to their work this would bring. Thus, across all three case studies there were strong similarities which created a lot of in-built resistance towards the ES implementation as a result of the stability orientations they had.

There was also evidence of subcultural impact in the SCC case where there were differences between Asset managers (AMs) and Contract managers (CMs) such that AMs were focused on system benefits and operational efficiency, while CMs had the interests of the general public at heart. As such, there were conflicts around change due to some AMs continuing to use the legacy system because it could reliably report back to the general public about when maintenance was underway. This resulted in conflict with AMs trying to force CMs to change how they worked and this was resisted by CMs who had different priorities. In contrast, in the SAHB case, where there were no strong or moderate conflicts evident, there were still some subcultural differences between clinicians and IT as the clinicians were largely resistant to change even though the change was driven in part by a group of clinicians. This was resolved by IT bending things as much as possible to reduce the change for clinicians which resulted in the lack of conflict which was evident. So, within this dimension the impact of subcultures was to either affect how groups used the ES, or to mitigate the effect of the changes they would otherwise have been exposed to.

In terms of consequence, there was evidence of a change in cultural values towards becoming more change oriented in the SCC, FoodCo and SU cases. In each of these cases staff were forced to change and they resisted this to varying degrees. For instance, at the

SCC, staff continued to use the legacy systems or used workarounds to avoid entering in the detailed information they would otherwise need to for the ES. At FoodCo, staff had problems coping with change and there was a turnover of staff across the implementation. At SU, there was a mix of those who resisted the system and those who were prepared to accept it as they recognised the issues it was designed to correct. In all three cases, staff had to adjust to the use of the new system by force or by recognising the system benefits for their work.

Finally, in the SAHB case there was no strong conflict evident at the time the data was collected. This may have been due in part to the timing of the study with data being captured only during the first phase of the implementation when users did not have to start using the system yet. Thus, in the future there may be a different result once users start using the system.

4.5.2 Centralisation versus autonomy

In this dimension we examine patterns and contrasts concerning the dimension of control, coordination and responsibility. This dimension was the only dimension, from all 8 dimensions, which was found to strongly affect each case and where cultural change was predicted to have occurred. The following table shows the identity, struggles and consequences from this dimension.

Table 4.7 - Cross-case results for Control, coordination and responsibility

Case	Case 1 (SU)	Case 2 (SAHB)	Case 3 (FoodCo)	Case 4 (SCC)
Identity	There was no centralised power within the university and strong autonomy was exhibited by both organisational units and individuals as they largely acted as they wanted.	Different organisational groups had their own autonomy and central authorities did not have the power to directly force them to complete tasks when needed.	Business units and unit managers were used to doing their own thing and making their own decisions.	Within the SCC there were common goals and priorities aimed at meeting the needs of the community and regulators. However units had their own priorities, goals and ways of meeting such goals.
Struggles	The autonomy of many units' changed as they lost responsibilities and decision making authority, to more centralised functions where standardised processes replaced the custom and individualised processes they had before.	Laboratories and GPs had their own ways of working and it was difficult to push new changes. Clinicians were responsible for their patients and would oppose anything that might increase clinical risk. Staff were not directly accountable to the project team and would prioritise operational work over project work.	Business units had to become more centralised and standardised. Some managers also resisted the loss of autonomy by trying to retain control within their unit.	Units often did not share a common purpose, and had their own processes and ways of working. These they had to mostly forego in favour of centralisation of processes to support the ES implementation.
Subcultures	-	Clinicians vs. IT	-	Contract managers versus Asset Management
Consequence	Units that lost autonomy were resistant and this slowed the process down as disputes were resolved. Units are treated more equally within the system as standardised processes affect all. The result was that the university has become less autonomous than it was before.	Tensions with autonomous groups meant centralised efforts were needed to facilitate participation and change. These tensions created disputes between different groups that delayed the project and resulted in higher costs being incurred.	Standardised processes cut across business units and new development is now centralised. There is more concentrated decision making to support SAP as a shared system. FoodCo has become more concentrated than before.	Disruptions as units could not agree on common goals and struggled with having to give up power and responsibility. More central monitoring of staff and senior manager involvement to rectify disputes. As a result, the SCC became more concentrated.

KEY: Shaded column = Strong conflict.

Non-shaded column = Moderate conflict.

Blank column = No evidence or Weak evidence of conflict.

Across each case, there was strong autonomy evident in the identities which lay at the foundation of the struggles that occurred. At the SCC, there were common organisational goals, but units within that organisation operated in their own ways to meet such goals. There was often very little coordination between these different units who often had conflicting responsibilities. This was very similar to FoodCo, which although a private company, also had an organisation with business units that tended to do their own thing

with little coordination with each other too. For the SAHB and SU, this autonomy was slightly different in that it was more due to the occupational roles of different group members rather than due to the organisational units they belonged to. For instance, at the SAHB, clinicians conducted their practice based on their own judgement and training and were only answerable to other clinicians through collegial processes. At SU, academics had freedom of thought and operated within an environment that encouraged individual endeavour and choices. Collegial processes were important here as well to monitor and control their behaviour. Thus there were differences between these two sets of cases. Across all cases though, there seemed a lack of centralised authority that could single-mindedly drive the ES implementations. In each case there were struggles that could have been resolved by stronger leadership and a clearer focus, as was seen with the 'autocratic' rollout in the FoodCo case.

In terms of struggles, the SCC, FoodCo and SU cases all shared struggles that revolved around tensions between retaining custom processes and the need to implement centralised and standardised processes. Organisational units had their own ways of working and the ES implementations served to replace this with standardised processes that were often controlled by central authorities. For example, at SU faculties lost control of enrolment requirements to Student Administration, while at FoodCo, organisational units had to work more closely together and share use of the central product database. In the remaining case, the SAHB experienced these problems too but the main struggles they had lay around conflicting priorities with stakeholders. For instance, the laboratories and GPs had their own ways of working because they served different purposes and had different priorities. More importantly, both groups were autonomous to the SAHB and there was not a direct force that could be applied to make them do what was required, when it was required by the project team. This was also evident on the project team itself where team members pursued day to day operational matters before tackling project work. The result of which was that project tasks took much longer to complete than if they had been working solely on the project.

There was evidence of subcultural impact in this dimension as well in the SCC and SAHB case studies. In the SCC case, there were increases in monitoring to better control how people used the system and to provide better asset management. CMs had different priorities and had to be pushed to use SAP. The reluctance of CMs in using the system led to more control

being applied as AMs tried to ensure compliance. In the SAHB case, IT had to understand clinicians better and worked at developing good relationships with them because clinicians had autonomy which IT could not question. The development of good working relationships between these different groups proved the best way forward for these implementations. So, the subcultural impact within these cases showed how control increased as a result of different groups values and how better working relationships were needed with autonomous groups that could not be told directly what to do.

The consequence of these struggles varied across all four case studies. In both the SCC case and the SAHB case, there were strong similarities as the struggles were based on the loss of autonomous processes and the adoption of standardised processes to support the ES. In both of these cases, groups had to give up power and responsibility to more centralised authorities to support the use of the ES as a shared system. This was also the case at SU where standardised processes caused conflict. In this case, these conflicts were resolved by top management having to intervene and resolve disputes between the competitive units they controlled. In all three of these cases, the evidence also pointed towards cultural change, with each organisation becoming more concentrated and controlled as a result of the ES implementation. However, with the SAHB case, there were some differences to the other cases studies.

At the SAHB, the principal tensions were between the autonomous groups rather than the standardisation that was being carried out to support ResultSys. The IT department running the implementation did not have the power to force other units to comply with what they were doing and to get tasks completed according to their schedule. This resulted in tensions, delays and higher costs. There was also a difference in the likelihood of cultural change. In the other case studies there were fundamental changes in how people and units worked which caused cultural change. So far in the SAHB case these changes had not yet been made as users have not been confronted with the new system. So, although there may not have been much cultural change yet, this was expected to change when users began to use the system.

4.5.3 Isolation versus collaboration

In this dimension we examined patterns and contrasts within the collaboration dimension. The FoodCo case was the only case where a strong impact was evident due to the cultural

conflict within the dimension. Both the SU and SCC cases had lesser conflicts evident while the SAHB case had no evidence of any dialectic tensions across the implementation. The following table shows the results from the individual case studies.

Table 4.8 - Cross-case results for orientation to collaboration

Case	Case 1 (SU)	Case 2 (SAHB)	Case 3 (FoodCo)	Case 4 (SCC)
Identity	The university had a strong collaborative culture but this had been eroded by pressures towards more individual accountability.	-	Business units were used to working within a silo culture without collaborating with other units.	Units worked alone and there was little collaboration across council which was challenged by the increasing need to collaborate in SAP
Struggles	The implementation was siloed leaving staff feeling excluded from decision making while others did not take part leaving the project short of institutional knowledge.	-	Business units had to collaborate more with other units to share an integrated system because errors and unilateral changes to the system affected everybody.	Units preferred to work alone and did not like others telling them what to do even if they were better placed to do so.
Subcultures	Service units versus academics	-	-	-
Consequence	The lack of involvement, either voluntarily or involuntarily, meant the ES was poorly configured to meet staff needs. As such, the SMS has had an uncertain impact on the overall culture of the university.	-	The involvement of project staff from different units has formed the basis for ongoing intra-unit collaboration. As a result, FoodCo has become more collaborative.	There were problems across the implementation due to groups not collaborating with each other. The effect has been that collaboration has increased as a result of the ES.

KEY: Shaded column = Strong conflict.

Non-shaded column = Moderate conflict.

Blank column = No evidence or Weak evidence of conflict.

There were some noticeable differences between the three cases with respect to their orientation towards collaboration. The SCC had a very strong silo culture where individual units worked alone and individuals did not work with others outside their units. This could be compared to both FoodCo and SU which also had silo cultures but where staff were generally receptive to collaboration on an individual level.

As the identities varied across these cases, so have the types of struggles that resulted. For both the SCC and SU, the struggles revolved around staff not wanting to be involved on the project or not wanting to collaborate with other groups. For instance, at the SCC, those involved with the GIS mapping of assets ignored requests from CMs to oversee and monitor

what they were doing even though CMs would become the end-users of the system and were the ones most familiar with the assets and their locations. Likewise, at SU, academic managers did not want to be involved on the project because they felt they could provide feedback through meetings, and as a result the project lost the valuable institutional knowledge they had. At SU, there were also attempts to limit collaboration. For instance, at SU staff felt they could not consult widely because it would take too long to engage in such a process and they did not have the time to incorporate such feedback anyway when the project had such tight deadlines. At FoodCo, the involvement of different groups and staff on the project team helped break down the silo culture and create a collaborative environment that enabled the project after Go Live.

In terms of subcultural differences, there was no real evidence of this in any of the cases except at SU. At SU, there were some differences between service units and academics in that academics tended to be more used to working alone and service units were used to working in teams. There was also evidence that some service units had tried to develop more collaborative approaches because they found these led to better outcomes for projects. For instance, on IT projects if IT worked more closely with customers on projects they found the results were better. The differences between these groups have led to tensions with service units not feeling that academics were always open to their ideas. Further, it could also be hard to arrange collaboration between service units and academics as there was a mutual feeling that particular projects belonged to particular areas. So, a project originating from a service unit was considered as something that that area should take care of. There was then some impact of this on the ES implementation because this was a service unit driven project so that academics did not feel as if they should be involved.

Due to the variety of values across studies and the resulting tensions, there were also differences in the consequences too. At the FoodCo case, collaboration was likely to have increased at the expense of the silo cultures that existed before. For instance, at FoodCo, staff had to work more closely with other units because mistakes in the system had a global impact and they had learned the importance of the need for collaboration. For the SU case, the outcomes were slightly different because it seemed that the project team tried to isolate themselves from the organisation so they could quickly implement the system without being bogged down in consultation with users. The result was a system that did not meet user needs and an implementation that was conducted in a more isolated environment than

what had been envisioned in the planning stage. At the SCC though, there did not appear to be enough evidence to suggest that collaboration had increased as there remained a strained relationship between Asset Management and Contract Managers over their use of the system which is hoped will change in the future. So, in the FoodCo and SU cases there seemed to have been a movement towards more collaboration, which either reinforced the existing culture, or worked to reduce the autonomy of units that existed before.

4.5.4 Hard data versus personal experience

In this dimension patterns and contrasts were examined across the cultural value of basis of truth and rationality. In only the SCC case was there any evidence of tensions that affected the implementation.

Table 4.9 - Cross-case results for Basis of truth and rationality

Case	Case 1 (SU)	Case 2 (SAHB)	Case 3 (FoodCo)	Case 4 (SCC)
Identity	-	-	-	Reliance on personal experience to solve problems; use of data for problem identification and resolution was more often confirmatory and second to personal experience.
Struggles	-	-	-	Contract managers had to become more data oriented to use the system, which conflicted with their focus on personal experience for identifying problems.
Subcultures	-	-	-	Contract managers versus Asset managers
Consequence	-	-	-	Different groups struggled with the SAP depending on their orientation to this dimension. CMs struggled as the SCC became more data-oriented, while AMs embraced the change as the system fitted their data-orientation

KEY: Shaded column = Strong conflict.

Non-shaded column = Moderate conflict.

Blank column = No evidence or Weak evidence of conflict.

In this dimension, in only one of the case studies was there any evidence of dialectic conflict that affected the project. At the SCC, CMs became the main group of users of the ES and they had an orientation towards the use of personal experience. The ES meant a change in this value with processes and data becoming more important to their working practice. This was something they mostly did not understand and meant they had to adjust to a new way

of working. So, the struggles that occurred were due to the need for this group to adopt a hard data orientation to best use the ES.

In the other three cases, this was not likely to have caused tensions because these organisations already had a hard-data orientation. At FoodCo, weights, margins and volumes lay at the core of their business, so too at the SAHB where the slightest change in a test result could indicate a sick or healthy patient. At SU, scientific approaches were also valued because this lay at the core of the research process academics ascribed to.

This dimension seemed to show that an organisation could struggle with ES implementations when they did not have a hard data orientation but there was also evidence this could be subcultural as well. At the SCC, tensions were evident between the CMs and AMs in the implementation of the ES. The CMs, worked at the coalface in terms of getting information into the system and were used to using their own personal experience and intuition in their work. On the other hand, AMs, who monitored the system, had no such orientation and were very comfortable with data and numbers. Thus, the tensions lay with CMs struggling with the new way of working where it was more important to have a hard data orientation which fit with how the system now worked.

In terms of consequence, for the SCC, staff struggled to adapt to the new way of working. Overall though, the evidence suggested that there was evidence of cultural change as the organisation shifted towards being more data oriented as this reflected how staff must now work.

4.5.5 External versus internal motivation

Motivation was one of two dimensions where there was no evidence found of tensions that affected any of the case studies that were conducted.

The four cases differed a bit in how staff were motivated. Both the SCC and the SAHB had staff that were internally motivated by the provision of service to the community and patient care, respectively, within each organisation. Staff were often working at lower wages than they could receive elsewhere because they believed in the work that they were doing. At FoodCo, staff were more externally motivated by the benefits the company provided and the 'family' atmosphere of working within the co-operative. However, performance

management of staff was not a key aspect of operations at both FoodCo and the SCC. At the SAHB, motivation was not a problem as patient lives were often at stake and clinicians were accountable to their peers for the decisions they made. While at SU, there seemed to be a balance of motivations for staff as there were rewards from research and teaching and there were various benefits provided.

There were no cases where there was strong evidence for struggles between the internal and external values within these cases. Instead, the internal and external motivations tended to work as complementary factors that enabled the project. In all cases there was more of a focus on meeting goals that the project had to overcome which was offset by softer motivations such as the development of camaraderie and the satisfaction derived from learning new skills that could improve careers.

4.5.6 Process versus results

In this dimension there were three cases where there were strong tensions that affected the ES implementation. Only in the SU case was this conflict not evident. The following table summarised the findings from these studies:

Table 4.10 - Cross-case results for Orientation to Work

Case	Case 1 (SU)	Case 2 (SAHB)	Case 3 (FoodCo)	Case 4 (SCC)
Identity	-	The SAHB had a strong process culture based on the training and methods that clinicians were grounded in.	Business units were used to getting work done without much consideration of the process involved to achieve that result.	Results were most important but the way in which work was done often had an impact on the results that were achieved.
Struggles	-	Clinicians pressed for a rapid implementation while IT were trying to follow the necessary steps to do things properly.	SAP has required more of a process approach in selection, implementation and use which conflicted with staff who did not have that same understanding of process as they had just gotten work done when they had needed to.	There was a mix of value orientations in with units holding conflicting views regarding the process orientation of the SAP; most struggled with abandoning their results-orientation for a process oriented approach.
Subcultures	-	IT versus clinicians	-	Asset managers versus contract managers
Consequence	-	Clinicians wanted results and IT wanted to follow the process which caused frustration despite both groups sharing process orientations. Otherwise, the process culture of the SAHB smoothed the implementation.	The project overran its budget because gaps were never properly identified or planned for. Staff had to become more process oriented to use the system. FoodCo has become more process oriented as a result of using the system.	Contract managers, though resistant, have become more process oriented as the system requires the orderly collection of to realise system benefits. The change has resulted in the SCC becoming more process-oriented than before.

KEY: Shaded column = Strong conflict.

Non-shaded column = Moderate conflict.

Blank column = No evidence or Weak evidence of conflict.

This dimension is interesting because there were two cases with results orientations, the SCC and FoodCo, and two cases with stronger process orientations, the SAHB and SU. At the SCC, there was generally a strong results orientation, particularly amongst the Parks staff that were the target of the ES implementation. This was the same at FoodCo, where there was generally a focus on achieving results rather than worrying too much about how the work was done. At the SAHB, the organisation had a much stronger process orientation as it was important that the correct processes were applied to achieve results, and since this often involved patient welfare then this was very important to staff. Lastly, at SU, processes were largely important which was due to the systematic methods of academics.

In terms of struggles, these were most evident at the SCC and FoodCo where these organisations did not have process orientations. A process orientation was needed to implement and run an ES and these companies struggled because they lacked such an orientation and so they found it more difficult to implement and use the ES. At the SCC, this

was most evident amongst Parks staff that had to shift from a 'fire-fighting' working style to a more disciplined, systematic process where there was less need to be so reactive to problems all the time. At FoodCo, staff did not understand the processes they had or why they did worked the way they did so this impacted on their ability to setup new processes in the ES and it affected their ability to use the new system later. The ES demanded that the correct process be followed which conflicted with the many shortcuts they had used before. As a result, both of these organisations struggled with the ES implementation because they lacked the process understanding that was needed to use it. In comparison, the two other cases that did have a process orientation, had implementations that went much more smoothly as staff were better prepared to understand how the new system would work.

Just having a shared process orientation across the organisation was not always a recipe for success. At the SAHB, there were communication problems between IT and clinicians and tensions were the result. Clinicians wanted the ResultSys project finished as quickly as possible without respecting all the processes that IT needed to do to make it a success. IT may have also been over-simplifying what they did and downplaying the problems they were encountering which did not help clinicians understand what was going on. Thus, even between two organisational groups that shared similar orientations there could still be tensions that affected the ES implementation. There were also subcultural tensions evident within the SCC case between AMs and CMs. AMs had a process orientation and did not have any major problems dealing with the implementation while CMs lacked this orientation and had many more problems with the system. CMs then had to try to adjust to new working practices which caused many problems when the system went live.

The consequences of these struggles was that for both of the results oriented organisations, the SCC and FoodCo there was evidence that they were becoming more process oriented as a result of the implementation. Staff had to work through the right processes with the system to make it work and to deliver the expected benefits to the company. This came at the expense of their existing work practices which were no longer compatible with how they had to work now. For the SAHB, the tensions between IT and clinicians did create frustration between these groups but the result was that IT learned to be more understanding of clinicians and they have developed better relationships with them. Overall though, the process orientation helped smooth the ES implementation more than it inhibited it due to tensions between different groups. This was also the case at SU where the existing process

orientation also helped smooth the ES implementation and did not create the conflicts evident in the other cases.

4.5.7 Internal versus external change

In this dimension, the SU case had strong tensions while the FoodCo had lesser tensions evident. Both the SAHB and SCC cases had no dialectic conflicts evident. These results were then summarised in the following table:

Table 4.11 - Cross-case results for Orientation and Focus

Case	Case 1 (SU)	Case 2 (SAHB)	Case 3 (FoodCo)	Case 4 (SCC)
Identity	The university was internally focused as staff concentrated on teaching and research to produce the best graduates they could.	-	FoodCo was very internally oriented and was challenged by competitors, vendors and suppliers to change which created tensions.	-
Struggles	The internal focus was challenged by the newfound need to provide service to students and to prioritise student needs over staff needs to meet the competitive environment they were in.	-	There were strong internal drivers to change coupled with competitive pressures not to be left behind. On the project they struggled with vendors who had own vision for the system.	-
Subcultures	-	-	-	-
Consequence	The student focus meant the system was not customised for staff and many were discouraged by poor usability. Processes were prioritised for students which meant more staff workload. Overall, there is now an external focus to meet student and government demands.	-	The inexperience of FoodCo staff with ES meant the vendor was given too much leeway to configure the system which did not always fit FoodCo needs. The result was that FoodCo became more externally oriented as they now have to deal with a vendor with a strong voice for change.	-

KEY: Shaded column = Strong conflict.

Non-shaded column = Moderate conflict.

Blank column = No evidence or Weak evidence of conflict.

Two of the cases, FoodCo and SU, were both internally oriented. At FoodCo this was due to their siloed culture where different functional units got on and did their own work. The same pattern could be seen at SU, where again, the organisation was siloed and there was not much interaction between organisational units. The remaining two cases had much more balanced cultures. SCC and the SAHB were both public organisations and they were well oriented towards meeting the needs of the general public. Both of these organisations were

also attuned towards meeting external regulations and changes to such regulations became strong drivers for change within their organisations. In contrast, SU was also a public organisation but they were not traditionally oriented to student needs or particularly responsive to changes of external regulations. This was partly due to the prior culture where change had not been encouraged and staff focused on their own work. As such, they had fallen behind in meeting external regulations and had not kept up with neighbouring institutions with the need to compete for students. As such, there were tensions that arose from the need to shift from an internal orientation to a more external orientation where student needs became a priority.

In terms of struggles, for FoodCo and SU, the drivers for change were due to competitive pressures rather than meeting government regulations. For instance, at FoodCo they had a creaking legacy system that was due for replacement and operated in an environment where there were real competitive pressures being applied. At SU, they were in a similar situation with competition from other universities affecting their enrolment. These competitive pressures helped shape the attitude that they needed to be more customer focused which meant a shift from being internally-oriented towards being more externally-oriented.

Lastly, the consequence of these struggles was considered. Interestingly, for the two cases with a balance of orientations, the SAHB and SCC cases, there were no struggles evident within the cases and the opposing values worked in a complementary fashion. For instance, at the SCC, the external and internal drivers dovetailed together while at the SAHB the external demands largely fit with internal demands too. For the two cases that were internally oriented, both were challenged by the implementation creating conflict. At FoodCo, they were challenged by a strong vendor and the need to accept many of their configuration suggestions because staff lacked the experience of outside systems that might have helped inform their decision making. Indeed, FoodCo struggled with their vendor and appointed their own project manager and change manager to represent their interests in the project. SU were also challenged by the need to become more externally focused. Priority was given to students so the ES had poor usability and meant more workload for staff. As such, there were real struggles within this organisation in dealing with the new orientation. As a result, there was evidence to suggest that both FoodCo and SU were

becoming more externally oriented as a result of moving from their own internal systems to dependence and reliance on an external vendor and system.

4.5.8 Short term versus long term

In this last dimension, there were no cases where there were strong tensions between short-term and long-term orientations.

Looking at each case, three of the cases shared a long-term orientation while SU had more of a balance between short and long term orientations. All of the cases were challenged by the short-term nature of the project which was probably quite normal when dealing with implementations that needed to be completed by given dates. There was a little evidence of a common struggle between the need to focus on project goals and timelines versus the need to ensure that the implementation was done properly for the long term success of the system. At the SCC, the project was strictly run to meet deadlines and work that would delay the project was either parked or cut-down to meet the deadline. This short-term emphasis could also be seen at SU, where they also had tight deadlines and anything that slowed the project down was parked for later. In both of these cases these organisations had a lengthy shakedown period as they had to debug and complete this work. In contrast, at both FoodCo and the SAHB there was perhaps more balance. At FoodCo, they needed the system to work for them so they were more accepting of delays. At the SAHB, regionalisation work and adherence to external standards slowed the project down but were clever long-term decisions that would pay off in the future when more connectivity would be needed with other systems outside the SAHB.

The result was that both the SCC and SU experienced problems after Go Live because they raced through the implementation and parked issues for later. Perhaps this had benefits for the success of the implementation but this also meant a lengthier shakedown period was needed. In contrast, at FoodCo and the SAHB, the short term and long term values were more complementary in nature helping enable a better implementation rather than creating tensions. Overall though, there was no strong evidence from this dimension of conflicts which affected the case study implementations due to dialectic conflict.

4.5.9 Post-hoc analysis of customisations and configurations on system benefits

In the discussion chapter (Chapter 5), a model is inductively developed from the results of the thesis and the wider literature. This model postulates that where the ES was pushed towards meeting the values of the organisation there was likely to be a reduction in the benefits of the ES to the organisation. These changes may be made to reduce resistance from organisational users towards the system and represent moves to customise the system towards the organisation and its cultural values. As this was not an explicit focus of this thesis, a post-hoc analysis was conducted of the results to review each case study and to determine if there was evidence to support this element of the model. So, each case study was examined in terms of the customisations and configurations that were done and what the rationale and results of these were. A cross-case analysis was then conducted to examine these results together.

CS1 – Southern University

At Southern University, the project team had to implement the project quickly and for a fixed sum of money. The requirements and system selection was based on the fit to a set of requirements that were drawn up from processes that needed to be improved. The project team pushed for a vanilla implementation where there was little customisation of the system to meet user or department needs due to the limited time available. Further, the users were sold on the configurability of the system to prevent resistance to the implementation. Any customisations were expected to come after Go Live although the intention was to standardise and improve the efficiency of processes at SU which meant few customisations were done. For instance, grading was incorporated into Omega and a system of anytime enrolment was implemented which removed unique processing rules for workload applications. One area which was configured in favour of the organisation was double-coding, which effected efficiency, although this was also on a timeline for being phased out. So, at SU, the implementation was in favour of the system and the benefits it would bring because if the system had been developed to meet unique needs then it would have compromised the project aims of standardisation and efficiency.

CS2 – Southern Area Health Board

There was limited evidence of customisation and configuration towards the organisation at the SAHB. ResultSys largely operated in the background to import results with existing users

largely unaffected. Clinicians still received information from the system in the same way they usually did as they would have been very resistant to moving to a new application. However, patient privacy was important in order to meet relevant government legislature. The need to implement an appropriate approvals process for patients meant that not all data could be imported into ResultSys which compromised the goal of having all data available to clinicians. In the second stage of the implementation there was more need to customise ResultSys to fit how GPs were likely to use it within their existing systems. GPs needed an integrated solution within their practice management system which would be easy to use, as they were otherwise unlikely to use the system if it required separate logins. This was a finding from Northern's implementation of the same system so that something needed to be done by the SAHB if they wanted ResultSys to be used by GPs.

CS3 – FoodCo

FoodCo also wanted to conduct a vanilla implementation, mostly at the behest of the SAP vendor, although they realised the system would have to work for their business as well. As such, change requests were used to customise the system and to put some control around this process. For instance, changes were made to streamline portals to make the system easier for retailers to use and units of measurement were changed to fit what staff were used to using. Customisation was often needed due to guestimates made in blueprinting that needed fixing rather than due to targeted attempts to reduce resistance or improve organisational change. This resulted in the company over-spending their budget by many more millions than planned.

FoodCo also retained their WMS, HR and POS systems because they did not want the company to change everything at once. Although, since Go Live, the cooperative has been much more open to change and things like the customer loyalty program have been brought into SAP. New changes were often made to replace capabilities that were lost with the legacy system, such as with the introduction of the business warehouse and the improvements in reporting that occurred. In summary, SAP brought in a number of benefits to the cooperative including increased accountability, reporting, visibility, integration, accuracy and speed of action but at the expense of time and cost which were both over budget.

CS4 – Southern Community Council

At the SCC, there was also not much evidence of configurations and customisations that affected the implementation. In the pre-implementation stage, staff drew up requirements for what they wanted the system to do and SAP was selected as the system that best met those requirements. Parks and Finance then had to learn new processes to use the system. For instance, Finance had their whole system reconfigured which changed how they handled all financials for asset management. A continuous improvement plan was put in place to build on the system over time. This included plans to make changes to the system to improve how it was used by contract managers which could improve usability and change management. For instance, adding notes to work orders for better communication and more frequent, and accurate, updates back to the customer management system. Such changes were expected to improve use of the system and improve the benefits yielded from it.

Cross-case analysis

Looking at all four cases together, these show that configurations and customisations were an important part of each implementation to varying degrees. For some cases, customisations and configurations were made to improve usability and to help staff adjust to the new system. This helped the change management of staff into the new system. For instance, the decision to streamline portals at FoodCo meant that it was easier for retailers to use the system but came at the expense of making those customisations. Sometimes, customisations were made to fill gaps between the system and the organisation which may not have been recognised previously. For instance, FoodCo realised that the existing promotions module would not meet their needs and had to custom-build their own module to run promotions the way they wanted which was an expensive, and unexpected, undertaking. These cases also showed examples where the benefits of the system were curtailed by how the system was configured. For example, double-coding at SU was retained due to unit resistance but came at the cost of system efficiency. At the SAHB, privacy compliance meant that clinicians were limited in the results they could view in ResultSys.

So, there were plenty of reasons to show why customisation and configuration occurred in all four cases. This also showed that there was almost always a cost for these, but that this cost could also provide some benefits to the company as well. For instance, the addition of an expensive business warehouse was intended to improve management reporting but also help change management into the system. This analysis also showed that there was no

evidence for any configuration or customisations that severely compromised system benefits. An argument could be made for FoodCo and the excessive costs and time spent on the project but the cooperative were very happy with the results of the system and felt it met their long-term needs anyway. The SU case showed where this might not have had a happy ending with the desire to integrate and standardise processes. Perhaps if the project team had bowed to the desires of units then the system may have retained more unique processes which would have restricted the benefits realised from the system. Students would not have had such flexibility to enrol in the system if unique processes had been retained while efficiencies would not have been realised to the same degree.

4.5.10 Summary

Here, we summarise the results from all case studies and answer the questions of which cultural dimensions affected the ES implementation and what subcultural impacts there were.

In the orientation to change dimension, in three cases there was conflict due to the mismatch between the existing cultures and the need for change that accompanied the ES projects. In the one case where there was not an impact; users had not yet been exposed to change, which perhaps explained why there were not tensions evident in this case. There was also evidence of subcultural impacts from two of the cases where values differed between groups and tensions were the result of these differences.

The control, coordination and responsibility dimension showed very strong tensions evident across all four case studies. This was a result of the organisational autonomy in each case being challenged and reduced by the need for centralisation in the ES. As a result, the evidence suggested that all four cases became more concentrated as a result of the implementation. There were also subcultural impacts evident within two case studies although the reasons behind these differed in both cases.

For the orientation to collaboration dimension, there were differing values across all four case studies and a variety of different impacts. Conflict was evident in both FoodCo and SU but cultural change was only evident for the FoodCo case. For FoodCo, collaboration was either strengthened, or the existing silo culture weakened, as a result of the implementation. In terms of subcultural impacts, there was evidence of this in one case due

to tensions between units preferring to work together and those who preferred to work alone.

Within the basis of truth and rationality dimension, there was a mix of impacts due to the differences in initial values held by the organisations. Those with an existing hard data orientation suffered less than those with an orientation towards intuition and personal knowledge. This showed that this dimension could either enable or disrupt the implementation. There were also subcultural impacts evident in one case where groups held different value orientations. This showed the enablement/disruption that could occur within the organisation itself as a result of different values between subcultural groups.

For motivation, there were no struggles evident for any of the cases. Instead, this dimension was often complementary with internal and external motivations working in concert for the good of the implementation.

In the orientation to work dimension, there were three cases where there were strong tensions for the implementation. For two of these cases, there were conflicts between their existing orientation and the process orientation needed for the implementation. For the case where there were no cultural tensions evident, the organisation was already process oriented which seemed to suggest this was an important value for predicting tensions. There were also some subcultural impacts noted with two cases where different orientations between groups created tensions on the project.

For the orientation and focus dimension, in only one case were there struggles with all others having more mixed results. At SU there were major tensions because there was a noticeable desire to change their existing orientation which was not evident in the other cases. There was no evidence of any subcultural impacts as a result of the ES implementations.

Finally, in the nature of time horizon dimension there were no struggles evident in any of the cases. However, two of the cases were challenged by the short-term focus of the project and perhaps suffered unduly as a result after Go Live. There was no evidence of any cultural change or subcultural impact as a result of the ES implementations.

So, these results suggest that five of the eight cultural dimensions affected the ES implementations across all four case studies. These dimensions were orientation to change, control coordination and responsibility, orientation to collaboration, basis of truth and rationality and orientation to work. Of the others, the orientation and focus dimension resulted in strong tensions in only one study and was complementary in the others. This may highlight the importance of considering all dimensions because it was the organisations decision to shift from a staff to student focus which resulted in these tensions occurring. For the two remaining dimensions, motivation and nature of time horizon, there were not any struggles found in the ES implementations of these studies.

Further, there was also evidence of subcultural impacts affecting each of these dimensions. Some organisations could show strong shared values for certain dimensions, but the results show that there could also be noticeable differences between internal groups in their value orientations. These differences could then have different effects on the implementation and upon other groups engaged in the implementation.

Finally, the cross-case analysis of customisations and configurations showed a variety of these changes in each case that typically came at some cost to system benefits. However, there was no evidence of a customisation or change that severely impacted on system benefits and resulted in any major conflict.

Chapter 5 Discussion

In this chapter, we discuss the results of this thesis and compare those findings to the extant literature. A model is then developed and applied to examples from each of the cases.

So, the results from the previous chapter can be summarised into Table 5.1 which shows the pattern of results for each dimension, and each case, and breaks the results down into two columns; conflict and cultural change. The first regards conflict (Conflict), which identifies whether there was any conflict evident on the dimension. The second column was change (Change), where a large X (X) was used to mark where cultural change was identified as having taken place, or where there was evidence that it was likely to have taken place as a result of the implementation. Within the conflict column, each cell was marked with either a bold X (X), to mark where there was evidence of strong conflict on that dimension or a small x (x) which showed that there was moderate conflict evident on that dimension. A blank (-) showed that there was no conflict or tensions which could signify that the cultural elements were compatible/complementary and enabled fit with the implementation or where there was a lack of evidence of cultural conflict. Thus, the purpose of the table was to try and understand the pattern of results across each dimension, and each case study, to determine whether the dialectic conflicts that occurred led to important cultural change within the organisation and how these compared across all case studies.

Looking at the table we can examine the impact of conflict on cultural change. For conflict, we can see that in almost every instance, barring the SAHB case and the orientation dimension for the SU and SCC cases, that conflict within a dimension led to cultural change as a result of the implementation. These findings suggest that where conflict was evident between dialectic values in an implementation that this provides the grounds upon which cultural change can occur. In particular, this result seems to support the arguments for both cultural fit and social shaping in organisations, for instance Robey et al (2002) who theoretically argued that tensions could exist between established cultural practices and the need for new practices. This also reflects the social shaping literature (Williams & Edge, 1996; Boersma & Kingma, 2005a) such that it was the combination of the existing cultural values and those of the system which could determine change. Both of these issues are discussed in more detail in the following sections.

The second observation that can be drawn from this table is that where there was no conflict, or the existing cultural configuration enabled the implementation, then there was no corresponding cultural change. Thus, in cases where there was no conflict, the culture was persistent, and there was no transformation of the culture because the cultural value was not challenged to change. This too seemed to support the argument towards cultural fit such that a supportive culture could help enable an implementation while cultural change was only evident when values were challenged by new values which could create the conflict that could create cultural change. This was consistent with work from several authors who found that groups were more likely to adopt a new technology if their values matched those embedded in the new technology (Klein & Sorra, 1996; Morton & Hu, 2008). Whereas, this thesis also extends work by Strong and Volkoff (2010) by identifying values upon which tensions did exist due to cultural mismatches. Thus, these findings show the relationship between conflict and its corresponding impact on cultural change within organisations as a result of ES implementations.

Within this table, there were also a number of contrary results that conflicted with the general conclusions arrived at above. Notably, these occurred in the SAHB case where on two major dimensions (concentration versus autonomy, process versus results) there was identifiable conflict but no cultural change evident. This perhaps could be explained by the strategy of the project team and the stage where data was collected. In this case, the project team customised the system to the needs of users to avoid imposing change on users while the data in this case was collected from only the first phase of the project. It was in the second phase of the project where users would be exposed to the system itself and then be more likely to experience conflict and resistance to the system. This suggests that although there was some cultural conflict evident, there appeared to be no need for the organisation to change how they worked at this stage of the project, as they would not start using the system until the next phase had been completed. This could account for the contrary results seen in this case for the two dimensions where major conflict was evident but change had not occurred. This suggests that cultural change may only be likely after users were exposed to the system and had to adjust their cultural values accordingly. This is consistent with work by Leidner and Kayworth (2006) who stress the importance of understanding the full adoption process rather than any single aspect of it. This suggests that cultural conflict may vary across an implementation which was suggested by this contrary result. More work

however, would be needed to follow up these suggestions to better determine the outcomes within this implementation and understand the conflict, if any that had occurred.

Table 5.1 - Cross-case summary of results

Dimension	CS1 (SU)		CS2 (SAHB)		CS3 (FoodCo)		CS4 (SCC)	
	Conflict	Change	Conflict	Change	Conflict	Change	Conflict	Change
1. Orientation to change (stability vs. change)	X	X	-	-	X	X	X	X
2. Control, coordination and responsibility (concentration vs. autonomy)	X	X	X	-	X	X	X	X
3. Orientation to collaboration (isolation vs. collaboration)	X	-	-	-	X	X	X	-
4. Basis of truth and rationality (hard data vs. personal experience)	-	-	-	-	-	-	X	X
5. Motivation (external vs. internal)	-	-	-	-	-	-	-	-
6. Orientation to work (process vs. results)	-	-	X	-	X	X	X	X
7. Orientation and focus (internal vs. external)	X	X	-	-	X	X	-	-
8. Nature of time horizon (short term vs. long term)	-	-	-	-	-	-	-	-

KEY: **X** = Evidence of Strong conflict

x = Evidence of moderate conflict

X = Evidence of cultural change

Dash (-) = No evidence of tensions (or weak evidence)

(The highlights show contrary results which are explained in the sections below)

Table 5.1 also shows that for the orientation to collaboration dimension for the SU and SCC cases that there was no change evident from the tensions that were observed. This was despite the conflict that occurred between organisational units and the collegiality that existed at the individual level. For instance, for the SU case the system was intended to improve collegiality but the manner of its implementation (e.g. by reducing input into the system to reduce delays), and the transparency of the system (e.g. by making financials more visible across departments) may have had the effect of reducing collaboration instead as the system increased competition between units. For instance, if Unit A were to find out that Unit B had x amount more money for spending on staff than they did. This was similar to the SCC case where the adversarial relationship between contract managers and asset management did not suggest much of a collaborative relationship between these groups. Thus, in these cases, it was hard to determine what cultural change may have emerged eventually as these values were in a state of flux as a result of the implementation. This result was consistent with the dialectics literature which suggested that cultural change could vary across the life of the implementation (Cho et al, 2007; Carlo et al, 2012) which echoed the evidence found here where the cultural conflict was still unresolved and any cultural change was not apparent.

For the motivation dimension, this was supportive of the implementation across all four cases. In each case both external motivation and internal motivation helped the project succeed. For instance, at SU, the team building activities were key motivators for developing the camaraderie that existed on the team because there were no real financial incentives for staff. This worked in conjunction with internal motivation as staff got to work with new technology on an important project. This was observed in the other three cases as well, such that motivation was a complementary value which supported each implementation. However, the results from this dimension also indicate that such balances may not be enduring. In the SCC and FoodCo cases, it is possible that external motivation may become more important in the future as SAP allows management to more closely monitor the performance of staff. This suggests that even when there is a balance of forces at one point in time, there may still be forces opposing change which can affect this balance at later stages. Thus, a balance at any point in time may only mean temporary stability between these forces which can erupt due to ongoing events and external forces. In the following

sections these issues are examined in more detail around the areas of cultural fit, dialectics and social shaping, and cultural homogeneity and subcultures.

5.1 Cultural Fit

The purpose of this study was to examine the dynamics of OC within large-scale ES implementations. By their nature, ES impose their own logic on organisational structures and business processes (Davenport, 1998) so it is perhaps of little surprise to see that there are cultural impacts in such contexts. Indeed, the widespread use of packaged systems has increased the urgency of researchers to better understand organisational-system fit as implementations are likely to be difficult and unpredictable until this is understood (Strong & Volkoff, 2010). A dialectical analysis was used to uncover the tensions that can arise when there are mismatches between elements of the OC and those of the ES project. This addresses the importance of cultural fit in ES implementations and builds on the work of Strong and Volkoff (2010) and their misfit model by identifying particular cultural value dimensions where there are tensions due to cultural fit. This is important because addressing cultural fit should enable more rapid achievement of benefits for the organisation (Strong & Volkoff, 2010). These tensions were evident in each of the four case studies with four or five of the eight dimensions in each case exhibiting evidence of strong conflict. This indicates that within these case studies, there was a mismatch with the existing culture that needed to support the ES. This shows that culture was an important element in determining the organisational-ES fit as the conflicts had varied effects for each implementation.

At a basic level then, the results from this study suggested a range of dimensions that impacted on four different case studies. These dimensions were orientation to change, control coordination and responsibility, orientation to collaboration, basis of truth and rationality and orientation to work. These show dimensions where there were tensions and resistance due to cultural values not matching the new ES. Conversely, this is consistent with prior work which has shown that groups are more likely to adopt a technology if their own values match the values embedded within the new technology (Klein & Sorra, 1996; Morton & Hu, 2008). This is likely to ease the difficulties experienced with the implementation. For instance, Hill et al (1998) found that technology transfer was either hindered or promoted by certain elements of the Arab culture. Cabrera et al (2001) found that from a single-site study of a Turkish bank, that successful technology innovations required that either the technology

be redesigned to fit the organisation or that culture be designed to fit the values within the technology. This study extends such work by finding five salient cultural dimensions that can be used to predict organisation-ES fit. These dimensions also lend themselves to becoming operationalised in the future to provide measurement mechanisms for practitioners and researchers. This is useful because of the lack of survey work in this area and the value in being able to identify particular dimensions, or values, which predict fit (Leidner & Kayworth, 2006) and which could be measured and understood in relation to other variables.

Going beyond this, the real value of the results of this study lays not so much in identifying and being able to predict particular dimensions related to success. Instead, the value is in being able to shed some light on understanding the full adoption process and its dynamics. Leidner and Kayworth (2006) noted that studies needed to move away from understanding what specific cultural values could be used to predict technology adoption and move towards understanding the dynamics of adoption itself. Thus, it is necessary to step back from looking at particular dimensions, to looking at each case in general and (i) the conflicts that occurred within each context, and (ii) the conflicts (including commonalities and differences) that were observed across these cases and (iii) the effect they had on cultural fit the implementation project.

In the SCC and FoodCo cases, there were tensions observed in five of the eight dimensions. These organisations seemed to have cultures that were not supportive of the ES, so there were conflicts in many different areas with the new technology. The result of this was that these projects took longer and cost more than they might otherwise have done if the culture was better matched. For instance, for FoodCo, management did not want to fail and wanted a system they would be able to use, with the result being that they spent more money than planned to resolve disputes and make sure people were happy. These tensions also increased the length of implementations. At the SCC, there were major problems around giving up power to central authorities and disagreements around such issues were the cause of major delays for the project. These show the necessary mutual adaptation that must occur between an ES and an organisation which creates higher costs that might have been avoided if there were better cultural matches (Wei et al, 2005). These costs were due to customising the package and could create problems in the future with ES upgrades (Soh et al, 2000). Indeed, too much adaptation will increase costs but it was also likely to increase the likelihood of failure (Hong & Kim, 2002). The findings from the FoodCo study seem to

contradict this because although they made many changes to the ES they have enjoyed a successful project outcome despite the delays and costs incurred.

There were also interesting findings for the SU and SAHB cases too. In the SU case, there were fewer dimensions in conflict, with only four dimensions where conflict was found. This perhaps shows that the culture of SU was more supportive of the ES implementation than that of the SCC and FoodCo. However, this is where such analysis breaks down because despite having less 'conflicting' dimensions, the scale of impact of the tensions that were evident were at least comparable to those of the SCC and FoodCo. The tensions at SU did have a different effect where the project was very tightly controlled around budget and time. To compensate, the project team sought to insulate themselves from feedback to avoid delaying the project while side-lining issues that would also cause this. As such, users felt their views were not taken into account and they were promised things which were not delivered. The result was a system that provoked intense resistance from many users. This has then been a major obstacle towards the realisation of system benefits and trying to move staff into using the system. This situation is consistent with the literature with Morton and Hu (2008) suggesting that a professional bureaucracy like a university would have a lower degree of fit with an ES and be more likely to have a negative outcome from an implementation. Wagner and Newell (2004) also found that with a university ES implementation the system met only the needs of central administrators rather than those of faculty who use the system. This seems consistent with the findings from the SU case where the implementation had to be tightly controlled because the needs of other users would take too much time and money to resolve. This is consistent with predictions by Klein and Sorra (1996) who suggest that in environments with poor value fit and a strong implementation environment that employees will oppose and resist the system with compliant system use the most likely outcome.

Lastly, the SAHB case is an interesting case because it had the least amount of conflicts evident. Indeed, it could be suggested that in this case the culture was very supportive of the new system except that this case only focused on the first phase of the project which involved importing results into ResultSys. As such, the major conflicts were with laboratories in agreeing and changing their own systems to export the necessary data to ResultSys with the impact being delays to the length of the implementation. This phase did not involve SAHB users having to change how they worked, which would be part of the next phase to be rolled out. Thus, in this case, it was likely that further cultural tension and changes may

occur once users began to use the system and need to change the way they worked. This is consistent with Cooper (1994) who suggests that where “change does not conflict with existing cultural assumptions, then culturally-based resistance will not be an implementation issue (p28).” Indeed, Wei et al (2005) provided preliminary evidence that different ES stages were likely to encounter different misalignment problems. So, the findings from the SAHB case suggest that this could occur when users were exposed to the system, although more work is needed to verify this claim.

So, this section focused on examining cultural fit and how the results from this study have built on, extended and developed understanding of the role of culture within ES implementations. Next, this discussion will look more closely at the dialectics themselves and the cultural change that can result. Later, this study will also examine the role of subcultures and the role they played in these cases studies.

5.2 Dialectics and social shaping of organisations

The dialectic analysis of these findings shows how ES implementations can be expected to shape the culture of the organisation through cultural change. Indeed, Leidner and Kayworth (2006) found that two thirds of empirical studies examining culture and IT investigated the phenomena from the integration perspective (Meyerson & Martin, 1987), such that culture is viewed as persistent, uniform and consistent across the organisation. In contrast, this study finds that cultural values are expected to change as a result of implementing ES within different organisations. In addition, the extant literature has also focused on the impact of culture on technology, without considering how culture can be affected by IT too (Boersma & Kingma, 2005a; Kayas et al, 2008). In this study we examine the dynamics of change within ES implementations to show how cultural values can affect the implementation but also how the implementation changes the organisation. This is shown through the use of a dialectic lens which shows the struggles that occurs between values in the organisation and the system and the cultural change that can result from such struggles.

The findings from this study showed how dialectic struggles could lead to cultural change which builds on and extends the little work done in this area. For example, Jarvenpaa and Leidner (1998) showed how a local firm was able to shape their local culture by pioneering new information technology. Similarly, in Strong and Volkoff's (2010) study of a US manufacturer, they found that the ES required ways of operating that contravened the

existing organisational norms at the company. This then provoked change such as the need for process discipline which contravened the current 'hero' culture of getting work done. This study extends such work by providing empirical evidence of dialectic struggles and a set of cultural values that were expected to change as a result of the implementation while presenting dialectic analysis as a methodology for identifying such change.

This thesis argues that in each case study examined, there was a distinct set of cultural values within the organisation, and within the ES that would be implemented. The process of implementation then brought these different values together with the result being either organisational persistence or organisational transformation (Robey & Azevedo, 1994). These dialectics can then describe the tensions between established cultural practices and the requirements for new practices (Robey et al, 2002) leading to change. This was what was observed in the four case studies of this research. There were conflicts evident in five different cultural dimensions that had different effects on each implementation and which were likely to have predicted the overall success of the ES for each organisation. For instance, the struggle that FoodCo had over the need to become more process oriented was eventually overcome because if it had not, then the viability of the system would have been in doubt. At SU, the struggles around the loss of autonomy also created tensions that needed to be overcome but with the unwanted side effect of creating user resistance that has limited system benefits. Thus, tensions can create conditions which can impact across the life of an implementation and which can have important effects on the benefits derived from the implementation.

The use of dialectics can augment a process perspective because dialectics are major influencers of organisational change (Cho et al, 2007). Analysing each dialectic pair may not only identify the identity of the phenomena causing the tension but also identify the dynamic struggle between the opposing forces and how they play out across the implementation (Robey et al, 1994; Van de Ven & Poole, 1995; Robey et al, 2002; Cho et al, 2007). The findings from this study showed how these tensions could vary in importance across each implementation. For instance, in the SCC implementation, the tensions around hard data versus personal experience were most sharply felt after Go live when users had to change their mind-sets in the face of a new set of work processes and practice. In every case there was also tensions around change versus stability and this was almost always felt as strong tensions around Go Live. Thus, the relative importance of these dialectics changed

across different stages of each implementation and further understanding of why this happened was documented in the results for each case.

Lastly, the dialectic analysis also showed how this approach could be applied to understanding the mutual shaping of both organisations and ES during implementations. The social shaping of technology (SST) literature argues that not only does the technology shape the organisation (social shaping), but that the technology is also shaped by the social setting of the organisation (system shaping) (Boersma & Kingma, 2005a). Thus, socio-economic factors play as much a part in technological and organisational change as the technology itself (Williams & Edge, 1996; Boersma & Kingma, 2005a). In other words, SST argues against technological determinism and notes that it is the combination of technology and the organisation that determines change.

This study primarily focused on how the technology shaped the organisation through cultural change. At the same time SST suggests that the ES may also have changed as a result of the impact of the organisation. This aspect of system shaping however, was not fully explored in this study, although the findings did provide evidence of how customisation and configuration activities can be used to better fit the system to the organisation. This is a limitation of dialectic analysis which is principally focused on examining tensions and struggles such that outcomes related to system shaping, which is used to reduce resistance and conflict, were not as readily identified in the study.

In terms of social shaping, in this study, the findings might at first suggest that by implementing an ES with desirable cultural values then any subsequent implementation can shift an organisation towards such values. However, the dialectic process showed the key tensions that can impact on ES implementations and suggests the importance of the social context and the difficulty and unpredictability of the resulting cultural change, if any. For instance, in the SU case, the ES was intended to increase collaboration but may have had the opposite effect in strengthening the existing silo culture that existed between units. Alternatively, in the SCC case, it was the Asset management group that really helped push the contract managers into shifting towards a more data oriented working style rather than their use of the system itself. These show the value and importance of social influence during these implementations and the role of SST in explaining the change that has occurred in these studies.

For instance, in the SCC case, there were a number of examples of cultural changes as a result of the ES implementation. For example, the newfound importance placed on data, coupled with the need to attend to the processes within SAP, was changing the work practices of CMs, and over time was expected to impact their cultural values as they become more process oriented. This ongoing cultural change comes at a price with the SCC case study highlighting some of the struggles and resistance (e.g. system avoidance) that has accompanied this change in values. This provides an example of one case where the ES has reshaped the cultural values of the organisation as a result of the dialectic clash between values of the ES and the organisation. Indeed, the fragmented nature of such changes, i.e. change only occurring to some parts of the organisation's culture, also argue against the cultural homogeneity that is assumed in most studies that examine culture and IS (Gallivan & Srite, 2005; Leidner & Kayworth, 2006) which is an important point to be discussed in more depth in the next section.

5.3 Cultural homogeneity and subcultures

This study provides evidence to challenge the dominant view within the literature that considers culture as being homogeneous and stable across ES implementations (Leidner & Kayworth, 2006; Kappos & Rivard, 2008; Jackson, 2011). Extant studies have treated culture as being homogeneous and do not address the existence, or impact, of different cultural values that may exist within an entity (Jackson, 2011). Instead, the overwhelming body of literature on organisational cultural research in IT has treated culture as being stable, persistent and difficult to change (Leidner & Kayworth, 2006). The few authors that have examined these subcultural differences have found that this is not the case. For example, Huang et al (2003) investigated the relationship between organisational subcultures and the adoption of component-based software development methods. They found that the clash of values between these subcultures could hinder the information sharing and collaboration to integrate such technology. Von Meier (1999) examined work group subcultures and found that two groups had different cultural interpretations of the technology leading to conflict and resistance in their adoption. Ravishankar et al (2011) found three different subcultures (enhancing, counter-cultural and chameleon) that affected the alignment of KMS.

This study provides further evidence to support the view that culture should not be treated as a stable phenomenon across ES implementations. This study shows that culture can

change, and that tensions due to cultural conflicts can occur at any stage of an implementation. Evidence of this was discussed previously in relation to the examples of the SCC with hard data and the SAHB regarding change. These findings support the view that process research is ideally placed to be able to identify changes as they happen through an implementation. Such an approach may better uncover the cultural impacts in ES implementation. Cultural homogeneity is further challenged by the existence of subcultures within organisations and their impacts, and this is discussed next.

Several studies have found evidence at the subcultural level of groups with different cultural values that have affected IS implementations. Huang et al (2003) investigated the relationship between organisational subculture inconsistencies and the adoption of component-based software development methods. They found that clashing values among organisational subcultures hindered the information sharing and collaboration needed to effectively integrate component based software. Von Meir (1999) examined work-group subcultures and their interpretations of proposed technological innovations. She found that two different occupational subcultures (engineers and operators) had entirely different cultural interpretations of proposed technologies and, as a result, experienced conflict and resistance to adopting new technologies. Ravishankar et al (2011) found evidence of a counterculture within an organisation that affected the implementation of a KMS. These findings show the contradictory consequences of IT implementations due to potentially competing sets of values as a result of subcultures within the organisation (Robey & Azevedo, 1994; Robey & Boudreau, 1999).

This study also showed evidence of subcultural differences that affected each of the different case studies and cultural dimensions. This showed that while organisations may hold strong shared values on certain dimensions, there may be dimensions that differed within the organisation due to the values of subcultures. In this study, these differences were shown to have different effects on the implementation and upon other groups engaged in the implementation. This is consistent with the work of Von Meier (1999) and Ravishankar et al (2011) cited above such that these subcultures can have different interpretations of the technology which can affect their implementation and create resistance for others.

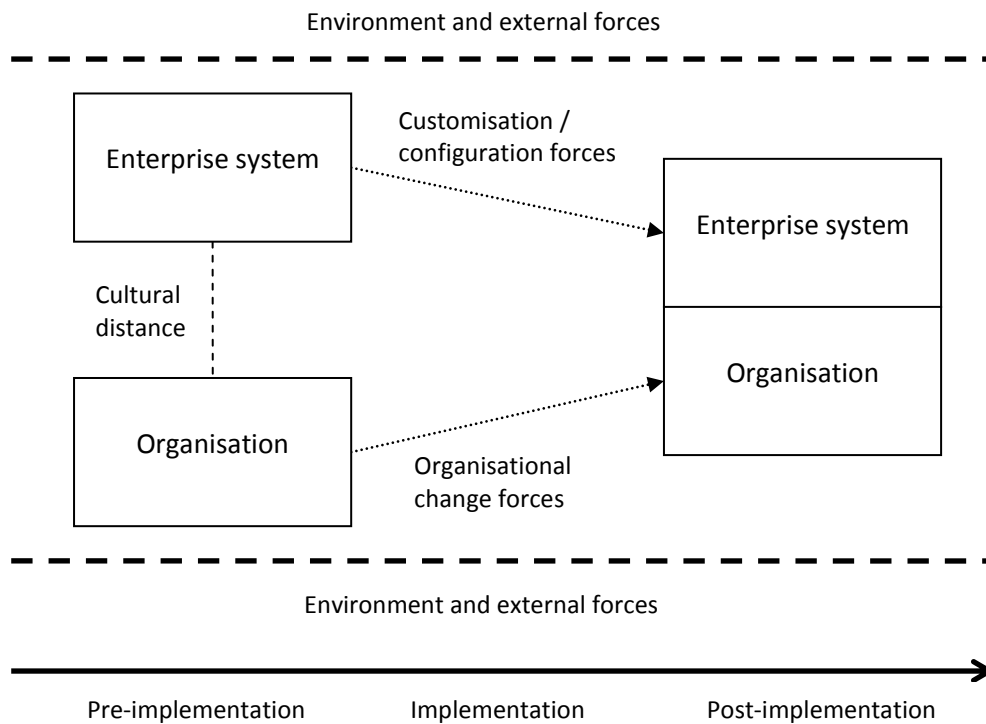
For example, in the SCC case, there was evidence of two organisational units that had markedly different subcultures to each other. Assets Management (AM) had a cultural orientation that favoured processes and data which was a good match with the values of the implementation and which helped them adapt to the use of the ES. In contrast, CMs were more results and experience oriented, which has impeded their adoption and use of the system. Further, there have been conflicts between these two groups as a result of their contrasting values, which have created further problems for the implementation project. For instance, CMs often failed to complete work orders as they should, with AM implementing procedures to monitor and enforce their use. However, the level of autonomy held by CMs has prevented AM from pushing the issue further.

Altogether these findings show that for this case, organisational culture was not homogeneous and that differences between subcultures can have different impacts on the implementation, with some values supporting the implementation and others hindering the project. Thus, this study further showed how conflicts between the different cultural values of the ES, the organisation, and sub-units within the organisation can result in struggles that impact the implementation, whether they hinder or promote implementation success. This addresses research gaps regarding what cultural values are important and the dynamics of how these values impact on ES implementations. This also provides further evidence that contradicts this view of cultural homogeneity, which was most evident in the SCC case, and is a note of caution for researchers assuming cultural homogeneity in organisational contexts they are studying.

5.4 Model development

The preceding analysis suggests the following model which was adapted from Van de Ven and Poole's (1995) model of dialectic forces. Van de Ven and Poole suggest that entities exist within "a pluralistic world of colliding events, forces, or contradictory values that compete with each other for domination and control (Van de Ven & Poole, 1995, p517)." It is this suggestion of colliding forces with which the original dialectic model is adapted to include the variable outcomes of such forces and the concept of cultural fit. The adapted model is presented in Figure 5.1, and describes the interaction of dialectic forces due to cultural variables across ES implementations and the effects they have.

Figure 5.1 - Dialectic Forces Model of ES Implementations



The Dialectic Forces Model of ES implementations (DFM model) seeks to illustrate the impact of dialectic conflict that can arise from cultural value mismatches between the organisation and the ES and the outcomes of such impacts. This is a process model which can be used to understand different stages of ES implementations. This is important because Wei et al (2005) showed that misalignments could cascade across an implementation where change drivers were often inconsistent and contradictory across project stages. Thus, it is important to consider a process approach to examining ES implementations with the model showing the pre-implementation, implementation and post-implementation stages and the related cultural distance between different entities. This is also a model that could be applied at different levels to uncover and understand differences between cultural values, subcultures and the organisation itself to understand outcomes (e.g. convergence of values versus tensions). Each part of the model is explained in the following sections. Next, the cultural fit aspects of this model are explained, followed by the resulting combination of the cultural values of the entities involved and the role of the environment and of subcultures on that process.

Cultural fit

The DFM model shows three stages of an ES implementation; pre-implementation, implementation and post-implementation. The pre-implementation stage shows the organisation and the ES and the cultural fit that they have. The distance between each entity represents the degree of cultural fit that exists between the cultural values in each entity and is shown as cultural distance. A large cultural distance represents a low degree of cultural fit while a small cultural distance represents a tighter degree of fit. Cultural distance can also predict the potential for conflict within the implementation. For instance, Leidner and Kayworth (2006) suggest that people are mostly unaware of their own culture until they experience a counter-culture which then provides the grounds for conflict between different groups. If the values supported the system, then the cultural differences, if any, would remain undetected and there would be no conflict. Thus, cultural distances can make these differences in cultural values more evident and increase the likelihood of conflict (Leidner & Kayworth, 2006).

In this model, the ES and organisation are brought together as part of the implementation. Within the implementation, these two entities are combined by two different forces, customisation and organisational change forces, which are discussed in the next section. The result of these forces is a combination of the ES and organisation which may resolve the cultural distance that existed. The Van de Ven and Poole (1995) model refers to this as a synthesis of the entities which represents that an end state has been reached. However, in this model, the combination of these entities may range from a tight coupling, as depicted in the model, to where there may be much looser couplings due to cultural differences that have not been resolved. Where a loose coupling results, this represents a state in which there is the likelihood of ongoing tensions between these entities and further conflict in later stages.

Thus, there is the possibility of ongoing tensions and conflict as a result of the implementation if the cultural distance between the entities is not resolved. Even in cases where they may be some balance between the entities, forces in subsequent stages could impact on this combination and lead to additional resistance or loss of system benefits. This is a view widely shared within the literature. Robey and Azevedo (1994) argue that conflicts may never be resolved and that the conditions for cultural change may persist into the future. Cho et al (2007) view such combinations as ongoing struggles due to the relationship

between each entity being uneven which can lead to changes in the future when these relationships change. Further, Carlo et al (2012) found that the thesis and antithesis (i.e. the two entities) were involved in a continuous struggle that did not result in a final, ideal state. These researchers suggest that within any combination, there remains the basis for ongoing tensions due to changes between the relationships of these entities. Thus, stability may be only temporary as the synthesis may be subjected to additional forces in subsequent time periods which may change the future balance of the combination.

Combination of entity and organisation

The forces aspect of the DFM model, is shown in how the two entities are brought together which may vary based on the implementation strategy. Depending on the implementation strategy, this could be to either customise the ES to match the organisation (customisation/configuration forces), to change the organisation to match the ES (organisational change forces) or some combination of both. The model depicts a scenario in which there is a balance between these two strategies such that both the organisation and the ES are changed to accommodate each other. If the two entities had begun with a small cultural distance then this would represent a situation where resistance would be unlikely to occur (Markus, 1983). However, in most implementations this is not the case and there usually has to be some movement of the organisation to support the ES or some customisation of the ES to fit the organisation (Hong & Kim, 2002; Soh et al, 2003). These scenarios are explained next.

Where the organisation is pushed towards adopting the values of the ES, there is likely to be resistance as values need to change. Cooper (1994) argued that a realignment of status, power and working habits, which can accompany new technology, may violate a group's shared values and result in culture based resistance. ES implementations may alter the organisational structure, job tasks, skills, rewards and even beliefs and values within the organisation (Klaus & Blanton, 2010) which may be needed to support the new system. Further, Markus (1983) argued that the greater the implied change between the organisation and the IS implementation, the more likely the possibility of resistance. This literature suggests that the further the organisation has to shift its values to meet the ES, the greater the resistance is likely to be. This is because changes in roles and responsibilities due to the ES may be at odds with the prevailing organisational culture which provides the basis

for such resistance to occur. This could also lead to an increased chance of ES failure (Morton & Hu, 2008).

Thus, users are more likely to resist the ES where there are differences in cultural values between the ES and the organisation (Markus, 1983; Klein & Sorra, 1996; Robey & Boudreau, 1999; Lapointe & Rivard, 2005; Strong & Volkoff, 2010). This provides the grounds for social conflict as participants move to change the status quo to match these new structures (Robey & Azevedo, 1994). Culture can provide the context for such conflicts to occur and when such contexts are transformed by conflict this produces cultural change. So, resistance is a necessary by-product of the cultural change that may be needed to support the system. Indeed, the organisation can reap greater benefits through organisational change than by customisation alone (Soh et al, 2003) because of the best practices that are assumed to be implicit within such systems (Davenport, 1998). There are also cost savings that can result from implementing standardised modules that can minimise initial implementation and future upgrade costs (Klaus et al, 2010). These are represented within the model with increasing resistance due to movements of the entity combination towards the ES.

Where the ES is pushed towards meeting the values of the organisation, through customisation and configuration forces, there is likely to be a reduction in the benefits of the ES to the organisation. Cooper (1994) argued that while IT can be adapted to the organisation, this is not always a positive step in terms of facilitating organisational change. Customising the ES is risky and time consuming and can lead to expensive and difficult to upgrade systems that may result in project failure (Soh et al, 2003; Leidner & Kayworth, 2006; Klaus et al, 2010). Vendors recommend the adoption of ES with little or no customisation for just such reasons but users often demand the system be customised to their needs (Soh et al, 2003). Hong and Kim (2002) also found that there was a 'sweet spot' of adaptation such that if too much was done it only served to lower the likelihood of implementation success. Resistance towards the ES can also lead to the loss of system benefits as well (Markus, 1983; Lapointe & Rivard, 2005; Klaus et al, 2010). Thus, it is likely that any major shift of the combination away from the original entities is likely to lead to loss of system benefit.

Combinations in favour of the organisation can also be symptomatic of implementations exhibiting weak forces for change and the lesser resistance that accompanies them (Robey

et al, 2002). Klein and Sorra (1996) suggest that in environments with weak climates for change that non-use of the system may prevail as there is no pressure applied to use the new technology. Where the implementation is weak (i.e. there is not enough power within the implementation team to force through necessary changes or to force compliance) then organisational cultural values may persist at the cost of system benefits. In such cases, users may use the system in a way which persists their values through the use of workarounds and data changes (Leidner and Kayworth, 2006). Thus, the loss of system benefits can be due to either planned change, where the system is customised to meet the organisation, or due to unintended consequences as a result of weak project leadership and organisational support, or as a result of resistance towards the system.

Environmental forces

The last element of the model is the role of the environment and external forces. These serve to either reinforce the changes that are occurring, or to add further change forces that can impact the combination of entities. For instance, Robey and Azevedo (1994) argue that social change is assumed to emerge slowly out of a web of interdependent elements. Jackson (2011) cites increased work pressure, conflicting priorities, and competition for limited resources as underlying reasons for change resistance or poor IT uptake. Thus, the organisational context and its environment will play some part in the change that occurs in implementations. In particular, the environment can represent the wider organisational environment in cases where the model has been applied to examining a particular subculture, which is examined next.

Subcultures

Lastly, the proposed DFM model can be used to examine the role of subcultures in ES implementations. Where subcultures are evident, this is likely to fragment the 'organisation' entity into different groups which can then interact differently with each other and the ES entity across an implementation. For instance, Wagner and Newell (2004) found that, within an ERP implementation in an American university, that the system only met the needs of the central administrators who imposed their needs onto all other groups which created conflict amongst these groups. Similarly, Bartis and Mitev (2008) found that the success of an ES system varied across the organisation's subcultures and the lack of fit with these indicated why users were dissatisfied with the system and under-utilised it. In both of these cases, the ES had different degrees of cultural fit with the subcultural groups involved which then had a

variety of different impacts. Thus, the presence of subcultural groups, suggests that the organisation does not have a singular, monolithic culture and that these subcultures can have different impacts on the implementation (Kappos & Rivard, 2008). In these situations, the organisation may not be best depicted as a homogenous entity but as a collection of subcultures which can react differently to the ES. This model could be used to examine such scenarios although the analysis and depiction of such situations becomes more complex.

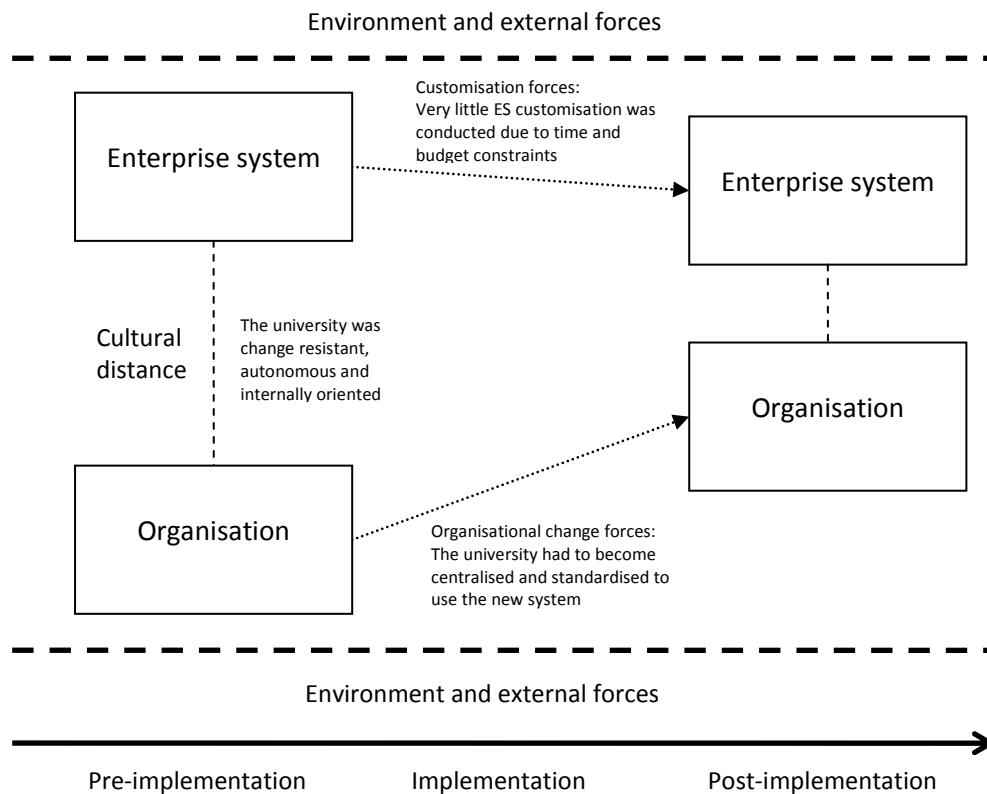
5.5 Applying the dialectic forces model of ES implementations

So, having developed a model that is grounded in the findings of the study and the extant literature, this model is now applied to explain each of the four cases. This brings the analysis full circle with the developed model being used to analyse the case data.

5.5.1 CS1 – Southern University

This case provides an example where the implementation team did very little customisation and the intention was to change the organisation to suit the ES. The dialectic forces model of ES implementations was used to depict this case in Figure 5.2.

Figure 5.2 - CS1 analysis on the dialectic forces model of ES implementations



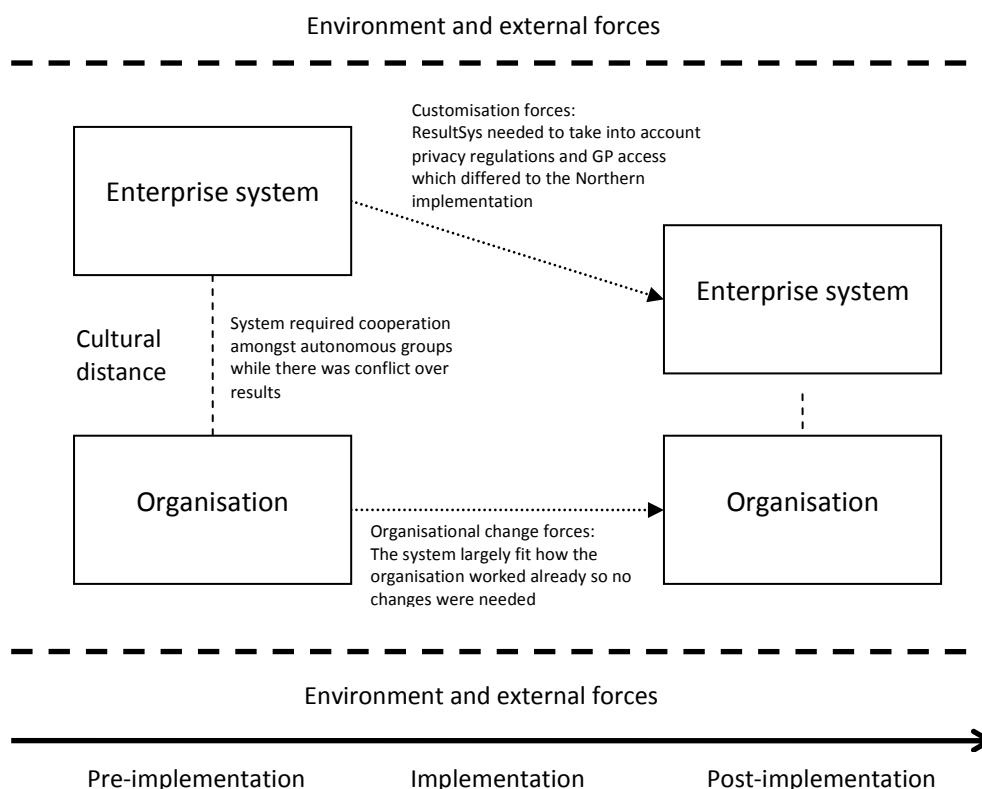
In this case, there was conflict evident on three dimensions (Stability vs. Change, Concentration vs. Autonomy, Internal vs. External) which had strong impacts on the implementation. This signifies that there was a lack of cultural fit between the organisation and the ES which suggests the large cultural distance shown in the diagram of the model. The implementation was aimed at changing the organisation as much as possible to meet the SMS system. This is shown by the movement of the organisation within the diagram to show the push for organisational changes to meet the ES. This movement created conflict across the implementation as users resisted this change in values. Examples of this conflict included resistance towards standardised processes, resistance towards change and moving from a staff to student focus.

The resulting combination is depicted as being loosely coupled because the organisation was still dealing with the challenges of using the new SMS and adjusting their work practices to suit the system. Further movements towards the ES are likely into the future though as ongoing development work continued to be prioritised towards student needs before those of staff and administrators.

5.5.2 CS2 – SAHB

This case provides an example where there was a lot of customisation during the implementation in order to meet the needs of users and minimise change. The dialectic forces model of ES implementations was used to depict this case in Figure 5.3.

Figure 5.3 - CS2 analysis on the dialectic forces model of ES implementations



In this case, there was much a much closer degree of cultural fit than with the prior case (CS1) which is shown in the diagram with the ES and the organisation being closer together. This meant that any movements of the ES and the organisation would attract less resistance or loss of system benefits than if the cultural distance had been worse. The implementation strategy was to mostly appease the GPs who would come to be the main users of the system. Thus, the movement was of the ES towards the organisation which represents a loss of benefit of the ES. This was shown through the loss of benefits to clinicians as a result of having to meet privacy regulations and the use of existing processes for ResultSys which

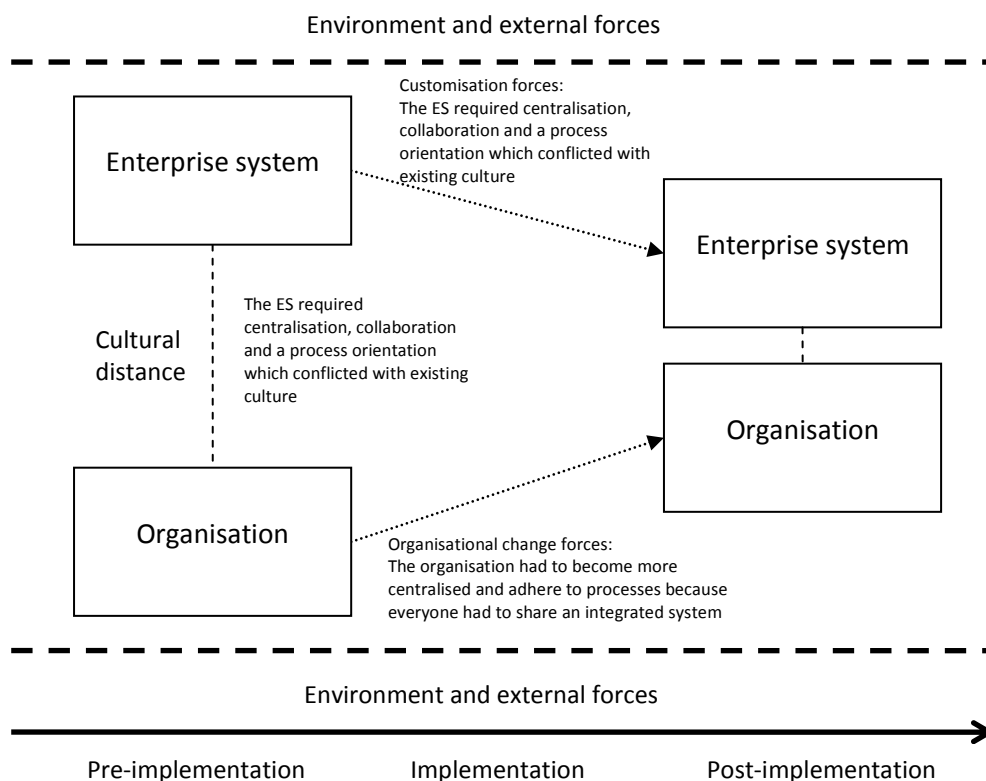
minimised change. However, this case study only focused on the first stage of the implementation so that any likely benefits or resistance would need further study.

The resulting combination is also depicted as being loosely coupled because the implementation has not reached an end-point at the time of the study, as ResultSys had yet to be rolled out to users. This explains why there was no cultural change as the conflicts that occurred were around the implementation process itself rather than resistance to the need to change cultural values.

5.5.3 CS3 – FoodCo

This case provides an example where the implementation team made a lot of customisations but also implemented a lot of the changes suggested by SAP. This shows an example of a case where both the ES and the organisation were changed. The dialectic forces model of ES implementations was used to depict this case in Figure 5.4.

Figure 5.4 - CS3 analysis on the dialectic forces model of ES implementations



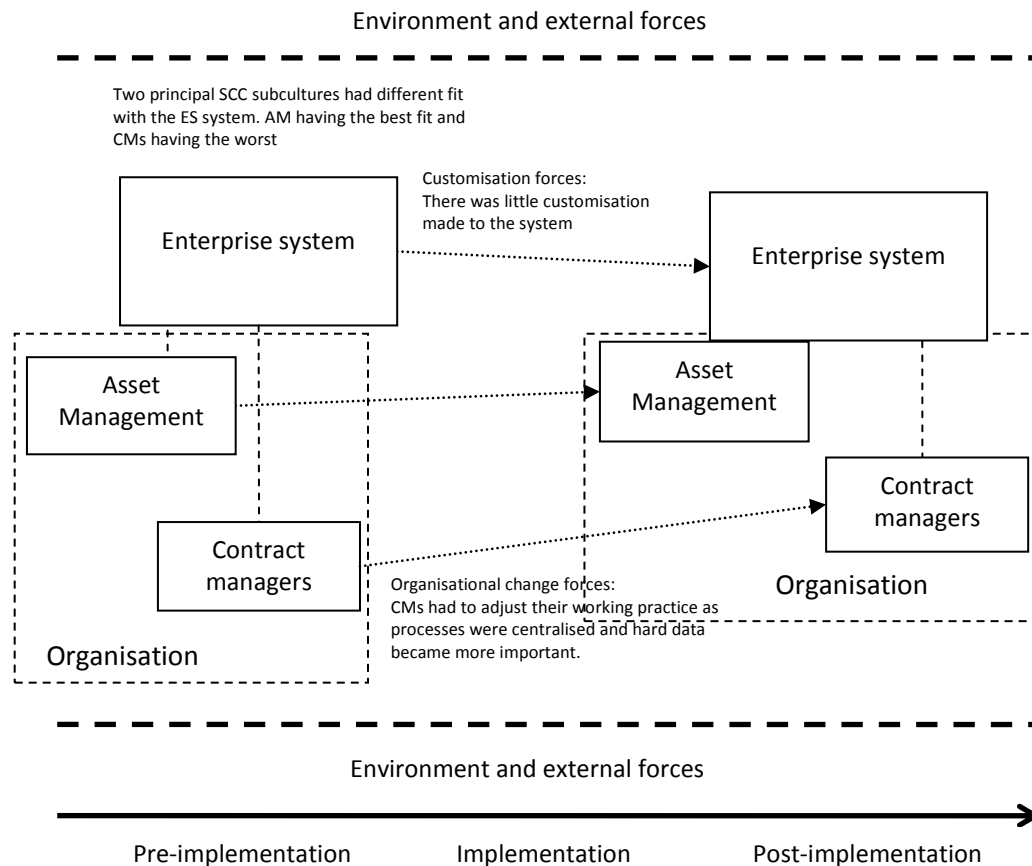
In this case, there was conflict evident on three dimensions (Concentration vs. Autonomy, Isolation vs. Collaboration, Process vs. Results) which had strong impacts on the implementation. This was represented in the model by the large cultural distance. The implementation was characterised by the SAP vendor pushing FoodCo to make many changes to their processes for SAP. However, there was also pushback from FoodCo who realised that the system would need to work for them as well. This meant there were also customisations and configurations made to the system. The largest of these was the replacement of SAP's promotions module with a custom-built replacement to fit how FoodCo marketed their products with their retailing partners. The movements of both the ES and the organisation are shown in the diagram where there were changes to each. This movement created conflict across the implementation as users resisted the change in values. Examples of this conflict included resistance towards standardised processes, problems with staff not understanding the need for coordination and problems with staff having to relearn how to do their jobs in the new system. There was also a loss of system benefits as the cost of customisations, and the time it took to make those changes, impacted on the return on investment of the project.

The resulting combination is depicted as being loosely coupled because the organisation was still dealing with the challenges of using the new SAP and adjusting their work practices to suit the system. This shows that there may be ongoing movements within the combination so that in the future further cultural change can occur as the entity and ES become further intertwined.

5.5.4 CS4 – SCC

This case provides a fourth example of an ES implementation where there were two subcultural groups that had different reactions to the ES implementation. The dialectic forces model of ES implementations was used to depict this case in Figure 5.5.

Figure 5.5 - CS4 analysis on the dialectic forces model of ES implementations



For this case, the analysis with reference to the model becomes more complicated because two principal subcultures are considered instead of a single homogeneous organisational culture. The asset management department (AM) and the contract managers (CMs) are depicted as two separate entities within the organisation. AM shared similar values to the ES which is why they are shown with a high degree of cultural fit with the ES. CM's on the other hand, had a much lower degree of cultural fit which is shown by the cultural distance depicted for them with the ES.

The model then shows the movement of these three entities as a result of the implementation. When implementing the ES, some customisation occurred which shifted the ES towards the values of the organisation. For AM, they already shared many cultural values with the ES which included a process orientation and a data orientation so their fit with the system improved. For CM's there were two cultural values that conflicted with how they worked, so they struggled with the implementation. In terms of the control dimension, both AM and CM's struggled with the demands for concentration and standardisation that

were needed to support the ES. However, the demands for concentration and standardisation were largely in favour of AM who then looked to impose more controls on CM's use of the system. This perhaps shows that these units became closer together than they were pre-implementation. The combination also shows that CMs have had to make the greatest movement towards the ES and this was reflected in the conflict and resistance from this group that occurred and is still likely to occur due to the distance that remains between them.

This chapter discusses the results of the within-case and cross-case analyses of the key dimensions identified in the case studies to uncover any patterns across the cases. Five dimensions were found to be important which provides evidence of dimensions and consequent impacts that are important in determining the cultural fit of ES to organisations. The thesis then showed how the dialectic conflicts within each dimension could lead to cultural change arising from the impact of the ES on the organisation. The findings from this study also questioned the assumption of cultural homogeneity implied in prior research (Leidner & Kayworth, 2006), as this study showed that the organisational culture changed across the project implementation stages, and that there were observable subcultures that differentially impacted the implementations also. Lastly, the thesis drew these results together and presented the DFM model. The model aimed to capture and explain the phenomena that occurred in each case. Next, the final chapter concludes this thesis and presents the limitations and contributions of this work.

Chapter 6 Conclusions

In this chapter, the contribution and implications for both researchers and practitioners are examined. This shows how the findings from this thesis can be translated into guidelines for practitioners and how this research builds on existing research and can be extended in the future. Following this, the limitations and generalisability of the findings are discussed. Lastly, this thesis concludes the key findings that were found.

6.1 Implications for researchers

In this section, implications of the findings from this research are examined. Contributions are presented in four main areas; cultural fit, dialectics and cultural change, cultural homogeneity and the development of a theoretical model.

6.1.1 Cultural fit

The findings from this thesis have implications for the research of cultural fit. The literature review found that where there were differences in cultural values between the ES and the organisation that this could cause conflict and resistance (Cooper 1994; Klein and Sorra, 1996; Dube, 1998; Wagner & Newell, 2004; Strong & Volkoff, 2010). The literature review found there was a research gap around identifying what cultural values were important for cultural fit and whether these applied across organisational types. This study addressed these gaps by finding that five of the eight Detert et al (2000) cultural dimensions were important across the four case studies examined. These dimensions were orientation to change, control coordination and responsibility, orientation to collaboration, basis of truth and rationality and orientation to work. Of the three dimensions that were not found to be important, the orientation and focus dimension resulted in strong tensions in only one case study and was complementary in the others. Both the motivation and nature of time horizon dimensions did not have any strong impacts in the case studies but did provide examples of complementary dimensions. The implication of this is that these eight dimensions have value for examining cultural fit issues in ES implementations. As such, these dimensions could be operationalised in the future to provide measurement mechanisms for practitioners and researchers alike. There is a lack of empirical work in this area and these dimensions could predict fit which could help address gaps for this type of research (Leidner & Kayworth, 2006).

6.1.2 Cultural homogeneity & subcultures

The real value of this study is in the contribution it makes to understanding the full adoption process of ES and the dynamics of fit with the organisation. In this way the findings made around cultural homogeneity and subcultures have much value to the literature. The literature review found that the predominant view of culture is that it is stable and persistent (Gallivan & Srite, 2005; Leidner & Kayworth, 2006) although some authors have challenged this view and suggested a multi-faceted approach to examining culture (Kappos & Rivard, 2008; Jackson, 2011). These studies argue that culture should not be recognised as a stable variable in research but as something that can be changed. This thesis extends such findings by providing further evidence against the notion that culture is homogeneous across organisations. The implication for researchers being, that they need to be wary of how they treat organisational culture in studies and assumptions of homogeneity of cultural values in organisational contexts.

This is particularly evident with how subcultures should be treated. The literature review suggested that cultural match is important between the organisation and the ES (Hill et al, 1998; Cabrera et al, 2001). However this study finds that cultural match may be difficult to achieve where there are notable differences between values within the organisations, in other words, when subcultures are present. Where subcultures are identified, there are likely to be variable outcomes due to ES implementation as these can impact on groups differently based on their own cultural values. This implies that researchers should be aware of subcultures and take them into account when examining the likely cultural impact within organisations. This extends the work of Huang et al (2003), Von Meier (1999) and Ravishankar et al (2011) to show that subcultures are important in the context of ES implementation too. This work also extends Wagner and Newell's (2004) study by explicitly identifying particular cultural dimensions upon which subcultures can be identified and their likely impacts examined. Indeed, understanding how subcultures can impact on IS implementations in general was found to be a weakness in the literature so this study provides evidence of such conflicts. Particularly, this study shows how different subcultures reacted to the integration and standardisation that is central to ES implementations.

6.1.3 Dialectics, social shaping and cultural change

This research also showed the value of the use of dialectics to understanding conflicts and the cultural dynamics that can be present within ES implementations. The literature review

found that dialectics were a useful method for analysing values within case studies because they can account for forces that create conflict and change between entities (Nordheim & Paivarinta, 2006; Carlo et al, 2012). The literature review found only two empirical studies which examined culture and ES (Robey et al, 2002; Soh et al, 2003). This study extends such work by applying the Detert et al (2000) organisational cultural framework as a means of examining cultural dynamics in ES implementations. This study applied these dimensions to four different organisations to examine the difference conflicts and forces in each one. This develops the ES implementation literature because cultural dialectics can provide deeper understanding of what causes conflict and struggles beyond the use of critical success factors which have been widely used. This research showed that cultural change can occur between the organisation and ES implementations as a result of cultural struggles. This moves the discussion away from the use of simplistic factors to a deeper understanding of the dynamics involved.

The literature review also found that Social Shaping Theory (SST) could explain the mutual shaping of technology and the organisation during ES implementations. The findings from this thesis show how an ES implementation could shape the organisation through cultural change. This extends the literature which has predominantly focused on the impact of culture on technology but not as much on how culture can be affected by technology as well (Boersma & Kingma, 2005a; Kayas et al, 2008). This research shows that this is not a deterministic process, and that the cultural values of both the ES and the organisation can combine to determine outcomes. This builds on the scant findings in this area such as Ju and Wang (2010) finding that there needed to be a balance between customisation and configuration to reduce resistance. Indeed, findings from the user resistance literature argue that resistance is usually determined by such gaps. This suggests that organisations need to have some readiness for change (Lapointe & Rivard, 2005; Kim and Kankanhalli, 2009). The SAHB case also showed that where a trade-off was made in favour of the organisation, such that the ES was customised to reduce organisational change, that resistance to the ES was also lessened in comparison to the other case studies. This is also consistent with findings from the literature around resistance and organisational change (Markus, 1983; Robey & Boudreau, 1999; Lapointe & Rivard, 2005; Strong & Volkoff, 2010).

6.1.4 Dialectic forces model of ES implementations (DFM Model)

This research also presented the DFM model which was explained in Chapter 5, as a model to explain the cultural fit, dialectics and cultural change observed from this research. This model was derived from discussion around the literature, findings and adapted from a model by Van de Ven and Poole (1995). This process model shows that dialectic conflict can arise from cultural value mismatches between the organisation and the ES and what the outcome of such conflicts can be. This model can then be applied to an ES implementation to explain outcomes. This model explains cultural fit as distance between the entity and the ES and explains how this can be linked to cultural resistance. The model can explain how cultural values can conflict based on implementation decisions to customise the ES to fit the organisation or to embark on organisational change to match the ES. The model can also explain how different 'coupling' between values can have different effects into the future, particularly when the combination is not in balance and forces in subsequent stages could have further impacts on this. For instance, this shows the role of environmental forces in the model and how they can absorb (support) or push (resist) the combination towards different outcomes. Lastly, this model can be used to explain subcultures which serve to fragment the organisation into pieces that can react to the ES implementation differently as in the case of the SCC (see Figure 5.5). This can be used to analyse the impact of different subcultures (whether resistant or supportive) on the ES implementation.

This model was theoretically grounded and empirically developed from the findings from this research. The model is presented to researchers with the opportunity to further test and validate the different components of this model using other methods including quantitative research, action research and longitudinal study. This model can also be examined in other organisational contexts, or national contexts, to determine how well it can be used to examine phenomena in those areas.

6.2 Implications for practitioners

The widespread use of packaged systems has increased the urgency for researchers to understand cultural fit as implementations are likely to be difficult and unpredictable till then (Strong & Volkoff, 2010). ES implementation is a major undertaking and businesses are losing billions of dollars annually in implementations that have failed or fallen short on delivering expected reductions in costs and increased profitability (Zhang et al. 2005). Thus,

research can help guide practitioners in better implementing ES. As such, this thesis makes recommendations for practitioners in terms of cultural analysis and creating cultural fit.

6.2.1 Cultural analysis of fit

From a practical point of view, the results from this study underline the importance of engaging in some form of cultural analysis to understand the potential cultural dynamics involved in ES implementations. Practitioners should work through the eight dimensions and identify where their organisation sits in relation to each before implementing ES. This cultural configuration can be used to identify what aspects of an implementation are likely to be affected by organisational culture and the additional resources that may be needed to help mitigate such effects. This could be used as part of system selection to identify systems that not only meet the functional needs of the organisation, but which also fit better with the culture of the organisation. Implementers would then be able to make more informed choices about whether to proceed with systems where there were substantial gaps in cultural fit. Culture can be problematic in IS implementations (Krumbholz & Maiden, 2001; Walsham, 2002) so the more information that implementers can have then the more informed their decisions can be.

Indeed, this thesis identified five cultural dimensions that were uncovered in the four case studies as important when implementing ES. These were an orientation to change, concentrated decision making, collaboration, hard data, and process orientation. If an organisation is approaching an ES implementation, and their organisational culture does not align with how the different dimensions are reflected in the ES implementation, it is recommended that they be wary of continuing the project without first considering how to handle the change, and the change management processes that will need to be put in place for the organisation to accept the ES. The results therefore highlight the importance of practitioners undertaking an analysis to understand the culture of the organisation and better assess its readiness for an ES implementation.

Cultural analysis could also help practitioners to better marshal resources towards managing cultural impacts if they decided to proceed with implementations where cultural fit was lacking. Implementers must understand that in such cases, the implementation of ES can induce conflicts within their organisations and lead to difficulties and even failures as a result. In particular, practitioners can use this research to identify whether, and in what

ways, the organisation may be better off after the ES due to changes in culture within the firm (Strong & Volkoff, 2010). This may be desirable or undesirable but should put implementers into a better position to predict how the implementation may unfold.

Gallivan and Srite (1997) make four recommendations when implementers run into counter-cultures; management can change the system functionality or design it to be more accommodating to user needs, they can abandon the project, they can allow users to modify or adjust the technology to suit their needs, and lastly, they can proceed knowing that cultural constraints may persist or affect the project. Thus, managers must be able to determine if an ES is a good fit to their organisation, or a good fit to only certain parts of the organisation, and whether extensive process redesign or system customisation may be needed.

An understanding of the cultural elements involved would also inform how project teams conduct the project. Project teams would be in a better position to predict where conflicts and resistance are likely to come from and be able to proactively plan to manage such issues. For instance, Kumar et al (2003) found that firms faced more behavioural and management related challenges than simply technical ones. In organisations with a strong autonomy culture, as seen in the SU case study, project teams would be in a better position to plan for how they would handle the organisational standardisation needed to support the ES. At SU, this was handled poorly as the project team promised customisation of the system to departments when they had no intention of offering this. Although, such decisions were partially mitigated by the rigid timeframes the project team found themselves under. Perhaps if the project team had been more honest with staff about the reasons for change then they might have been able to generate more buy-in than was the case from promising benefits that were not delivered. Indeed, this approach was successfully demonstrated at SU by the Student Administration department trying to rollout a new course advice module for staff in Omega. They found that getting departments involved in the change enhanced acceptance which helped them rollout the new module to staff.

It is also important to determine whether there are distinct subcultures within the company because in such cases the outcomes of the implementation can vary. Klaus et al (2010) argue that it is important for managers to understand the characteristics of subcultures within the implementation because they can then develop strategies that can meet the needs of these

groups. Huang et al (2003) also argue that the recognition of subcultures can help identify policy limitations around a new technology that could be changed to maximise its benefits. For instance, in the SCC case study, the collectivisation of business units into governance boards was one attempt to get around the autonomy that existed within the firm as it would have been impossible to cater the system to every group's needs. However, this process still failed to meet the needs of contract managers and they complained that those involved in the system development, were not users of the system after Go Live. Thus, it is important to not just get a variety of users involved in implementations, but to ensure that such groups are well-represented and have valued input into the decision making of the implementation.

6.2.2 Creating cultural fit

A lack of cultural fit was found in this study to lead to resistance towards ES. Indeed, the greater the implied change between the organisational culture and the ES, the greater the resistance is likely to be (Leidner & Kayworth, 2006). However, resistance is not always negative. Markus (1983) argued that resistance can be destructive because it can cause conflict and ill will towards an implementation which can consume time and attention. However, resistance can also be functional by preventing the installation of systems whose use might have ongoing negative consequences that would surpass any benefits the system may bring. For instance, an ES might be considered for adoption but be resisted because the organisation recognised that it would increase employee stress and lead to increased staff turnover which would negate the benefits of the system.

Another implication from the research findings is the need to create an organisation that is ready for change. For instance, Kim and Kankanhalli (2009) found that organisational support for change reduced user resistance to new IS related change. Benefits must be clearly communicated from the user's viewpoint and management must be involved to emphasise and support these changes. Organisational support can also be developed through training, guidance, time and resources to help staff learn the new system and guide them through any process changes that may be needed. Kwahk and Lee (2008) reinforces this view by finding that it was important for the successful adoption of ES that the management and project team pay attention to promoting readiness for change amongst users. Lapointe and Rivard (2005) suggest there is a 'window of opportunity' for tackling resistance to implementations where early resistance is focused on the system itself as

opposed to resistance that can happen later in implementations that can often be more political in nature. Thus, it is imperative to be able to address resistance issues as early as possible to prevent them becoming more unmanageable in the future. Finally, Klaus et al (2010) argue that management need to understand the issues of resistance and be able to deal with them in a manner that can have favourable outcomes. Management need to recognise resistance and be able to take steps to alleviate it when it happens.

Finally, decisions around customisation and configuration are also important in dealing with cultural fit. Ju and Wang (2010) found that customisations were important to align diverse social interests and to create integration with the system. However, as users become increasingly reliant on the system they began to search for the best practices of the SAP which had been customised from the system. Thus, the authors suggest that a polarized approach is not ideal and that some balance between vanilla ES implementation and customisation should be reached. This is consistent with work by Light and Wagner (2006) who found that some customisations were important to achieve integration with ERP. They suggest that configuration alone may not be enough to implement systems and that some existing practices may need to be retained and customised into the ES if they are valued within the organisation. This runs counter to the view of vendors that ES packages should be adopted with little or no customisations (Soh et al, 2003). Indeed, Soh et al (2003) argue that cultural mismatch requires either heavy customisation of ES to match the organisation or organisational change to meet the ES. Organisational transformation would be expected to yield greater benefits than customisation alone. Organisational transformation does not necessarily need to be short term in nature with a long run strategy possible to continually push alignment between the ES and the organisation (Soh et al, 2003).

6.2.3 Vendors

Finally, this study provides findings that have some implications for ES vendors. For example, these findings found five cultural values (orientation to change, concentrated decision making, collaboration, hard data, and process orientation) which created organisational conflict leading to unpredictable outcomes for the implementation. Thus, where an ES is being implemented into an organisational culture that does not align well with these cultural values then there are likely to be issues surrounding cultural fit and the implementation may then be more difficult to carry out (Soh et al, 2003). This was highlighted by Soh et al (2003) in their study of an ERP implementation in public sector Singaporean hospitals. These

organisations were able to gain some bargaining strength by coming together and negotiating with their vendor to provide localised features that aligned better with the organisations' ways of working. This suggests that ES vendors, in some instances, may need to consider whether they can (or should) create 'flavours' of their systems that would enable them to fit better with the different organisational contexts they are intended to support.

6.3 Limitations

The limitations of this research lie in the extent to which the case studies examined here can be generalised to other situations for either theoretical or practical interest. The cases examined included a public university, city council, public health authority and a private cooperative grocery business. The case could be made that this sample over-represented public organisations and so the results may not be generalisable to private organisations. However, in terms of cultural values, public organisations may only be likely to differ from private organisations in terms of the nature of time horizon dimension and the motivation dimension. However, both of these dimensions were not found to be important in explaining the conflict that was evident in these cases studies. This suggests that these dimensions could be more important for private organisations which may be a research avenue worth pursuing.

In mitigation, public and private organisations can otherwise share many similarities. For instance, in the SCC case there were divisions between Asset Management and contract managers which were likely to be just as evident in other organisations between administrators and users. The case studies examined in this study also showed a breadth of contexts which provide opportunities for extending these results into many different types of large organisations. Particularly as these case studies are representative of important sectors in the distribution, healthcare, government and education sectors. It was also an advantage that these case studies were all based in the same city. This meant that national and regional cultures were controlled for, such that observed differences in OC was more likely due to the organisations themselves rather than due to the cultural context they operated in.

Another limitation may lie in the generalisability of these results as they relate particularly to findings from the SU and SAHB cases. In these cases, both clinicians and lecturers had a greater level of autonomy than evident in many settings where they had more freedom in

their choice of whether to use a given system or not. Thus, future studies could examine differences between mandated versus voluntary use and determine what impacts this could have on cultural conflict and change. To further validate the model future research should also be extended to other groups in organisations which do not have such autonomy around system adoption. Thus, the findings from this study could be further strengthened and validated by studying the implementation of ES in different organisational contexts to determine the applicability of results match found here.

A further limitation was that cultural values were not explicitly measured in this study. They were assessed through evidence collected from each case study. Further studies could address this by operationalising these values and then testing them with a longitudinal study at different points in time. This could provide more evidence of the cultural change that can happen in ES implementations.

This brings up a secondary issue because the case studies were not conducted longitudinally so that evidence of cultural change was used because culture was not explicitly measured at the beginning and end of each implementation. This represents an opportunity for further research which could examine an ES implementation from start to finish and determine what differences there may be. For this study, it was not possible to conduct case studies longitudinally but this was mitigated to some extent by examining project documentation alongside the retrospective nature of the interview data to try to understand what was going on during the implementation projects. The analysis of project documentation and the interview data did not highlight any inconsistencies to suggest that the timing of the collection of data was likely to have biased the project to any significant degree.

There may also have been some memory loss or in some cases memory bias, such that facts may have been reported in a more positive light than what occurred. To minimise the effect of memory loss, three of the cases were conducted within one to two years of the implementation project having been concluded, while the fourth case (SAHB) was conducted during the implementation project. This approach permitted the interviewing of key persons who were directly involved in the project, minimising the need to rely on 'second-hand' data. Triangulation of findings (Eisenhardt, 1989) as well as the review of project documents where available also helped to address this issue. To minimise the effect of memory bias if any, multiple sources were also used to triangulate data (Eisenhardt, 1989). Thus key people

involved in the project were interviewed across all four case studies including the project manager in each case and a variety of other important staff and decision makers that were involved in each project.

Finally, it was a limitation of this study that mutual shaping was not fully explored in terms of how the organisation can shape the ES through customisation and configuration (i.e. system shaping). In this study the use of a dialectic approach focused the analysis on identifying conflicts and struggles, which in the case studies were evidenced most clearly in the impacts of the ES on the organisation rather than in the impacts of the organisation on the ES (through system shaping). Thus system shaping which is intended to reduce resistance to ES by reducing the cultural distance between the ES and the organisation was not readily apparent. The importance of system shaping however emerged during the analysis phase of the study and more so in the development of the DFM model, with some evidence of system shaping being found in the cases. For instance, at the SAHB, clinicians were very change resistant so the system was customised and configured to present information in the ways that they were used to. This finding was common to the SCC and FoodCo case studies where system changes were also made to improve usability of the system and to ease the change management process for staff by configuring the system so that it appeared more similar to the legacy systems they used previously. However, in the SU case limited changes to the system itself was a great source of conflict and tension for the implementation project.

6.4 Conclusions

In conclusion, by examining the dynamics of organisational culture across ES implementations this thesis builds on current understanding of how to implement ES systems. The study found that five cultural value dimensions were responsible for the conflict within four different case studies. These dimensions were orientation to change, control coordination and responsibility, orientation to collaboration, basis of truth and rationality and orientation to work. The remaining three dimensions that were not found to be the cause of conflict (Orientation and focus, motivation and Nature of time horizon) were often complementary to the project. Thus, this study can conclude that all eight dimensions are likely to be important for analysing the cultural values of organisations and ES for the purposes of understanding potential causes of cultural conflict or values which may support the implementation.

The use of dialectics provides a deeper understanding of what causes conflict and struggles in implementations beyond these dimensions alone. Dialectics can show how conflict can occur, or not occur, between the organisation and the ES which moves the discussion away from simplistic factors towards a deeper understanding of the dynamics involved in ES implementations.

Further, evidence from this thesis argues against the notion that culture is homogenous during IS implementations (Leidner & Kayworth, 2006). This study showed evidence that cultural values changed as a result of the ES implementations from the case studies investigated here. This occurred as a result of conflict between dialectic cultural values within the ES and the organisation. One implication is that where subcultures exist, there are likely to be differential impacts which may support or hinder system adoption for groups as in the case of the SCC implementation. Therefore researchers and practitioners need to be aware of the presence and possible dominance of some subcultures when accounting for culture in implementations. Indeed, this study furthers the view that culture is not homogenous and that cultural dynamics can influence ES implementations over time. However, more work is needed to examine the impact of cultural dimensions in different organisational contexts to determine what dimensions are important and what impacts they have. This can help identify and provide evidence that such cultural effects are generalisable beyond the context of the cases investigated here.

This study also proposed the Dialectic Forces Model of ES Implementation to explain issues of cultural fit, dialectics and cultural change that were observed in this research. This model can be used to show the interactions between the organisation and the ES that occurs during implementations. This can inform understanding of system selection and project management to create strategies that can deal with cultural conflict when it arises. One approach is to create organisational support for change with Kim and Kankanhalli (2009) suggesting the use of training, guidance, time and resources to help staff learn the new system and guide them through any process changes that may be needed. This must happen early in implementations as Lapointe and Rivard (2009) suggest there is a 'window of opportunity' for tackling resistance to implementations before it becomes political in nature. Balance between customisations and configurations are also necessary to minimise resistance and maximise organisational change. This is consistent with work by Light and Wagner (2006) who found that some customisations were important to achieve integration

with ES but which runs counter to conventional wisdom which suggests that ES packages should be adopted with little or no customisation.

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Appendix

1. Introductory letter to introduce research project

This was an example of the letter, or email, used as the introductory approach looking for organisations where a case study could be conducted:

Hi

I am a University of Canterbury PhD student examining organisational culture in enterprise system (ES) implementation. In particular, I'm identifying the effect of organisational culture dimensions across different ES project implementation stages. This study will address an existing research gap for empirical work examining organisational culture and ES implementations. Findings from such studies could be used to reduce the failure rate of ES implementations by furthering understanding of 'softer' implementation issues which may be important for implementation success.

To collect data for this research I am conducting a number of case studies within large organisations in the Southern area. Currently I have completed case studies at Southern University and the Southern Area Health Board. Ideally, I am looking for organisations that have implemented an information system that has crossed at least two functional divisions, i.e. an enterprise system. Interviews would then be conducted with project personnel and other stakeholders to identify what went on in the implementation. Typically there would be up to 10 interviews carried out of about 1 hour each in duration. It is also useful if I can identify a 'key informant' within the organisation. They can assist with the first introductory interviews to understand the general details of the project and organisation as well as helping identify people who could be interviewed later. A case study report will be used to discuss the findings of this study, with a research paper likely to be developed if significant findings can be made. Any such research paper will refer to the organisation and any participants anonymously.

Thanks

Lindsay Stuart
PhD Candidate
ACIS Department, University of Canterbury

2. Case Study Questions

Questions used as the basis for the semi-structured interviews conducted with staff from all four cases studies.

Level 1: Questions asked of specific interviewees

The following level 1 questions provide a general question outline for all interviews. Questions would need to be tailored to each interviewee's position and particular involvement in an implementation stage. A semi-structured approach will be used so that there is flexibility in answering each of these questions while new lines of inquiry can be pursued as necessary. The aim of course, is to try to address questions at deeper levels while being aware of new information which could further refine the study's questions.

KEY – Pre – Pre-implementation Stage, Imp – Implementation Stage, Post – Post-Implementation Stage

Introduction

1. What was your role in the implementation of SAP?
2. Can you describe your involvement in this project?

Organisational Culture Values and the ES project

General

1. How would you describe the organizational culture at this organisation?
 - a. What organisational values do you think are important to this organisation (*e.g. collaboration, goal orientation, motivation etc.*)?
 - b. What organisational values do you think were important to the ES project? Why?
2. Who do you think was a hero on the ES project? Why?
3. What do you think was your favourite characteristic of the SAP project?
4. What would you have told someone that had just started working on the ES project to help them fit in?
5. What best describes the management style of the ES project? E.g. Was it entrepreneurial (marked by individualism and risk taking) or bureaucratic (an emphasis on how things are done)?

Basis of Truth and Rationality (hard data vs. personal experience) – D1

1. During meetings you were involved with, were people encouraged to express their ideas, even if they were not fully informed yet? And did they express these ideas?
 - a. Is this characteristic of the organisation in general? Why? Why not? (ALL)
2. Was there ever anything during the ES project you felt just was not right, but could not explain why? If so, did you express this? Why or why not? (ALL)
3. Was there anything you assumed to be true about ES that you later changed your mind about? (ALL)

Motivation (external vs. internal) – D2

1. How are staff rewarded for their work? (ALL)
 - a. How were people rewarded for their involvement on the project? (Pre, Imp)
2. How were people motivated during the ES project? (Imp)
 - a. Is this characteristic of the organisation in general? Why? Why not?
3. Are people rewarded for their use of ES? (Imp, Post)
 - a. Do you think people's use of ES is adequately rewarded? (Imp, Post)
4. How do you think people were selected to be involved with the ES project? (Pre, Imp)

Orientation to Change (stability vs. change) – D3

1. What do you think drove the desire to implement the ES? (Pre)
 - a. Was the ES a necessary system to maintain current performance into the future, or was it a system that was seen as something that could bring increased benefits?
 - b. Do you think this reflects the general attitude in the organisation towards such projects?
2. Do you believe that the organisation is different now than before the ES project? If not, why? If so, how? (Post)
3. How do you think that organisation processes have changed, or are currently being changed, because of the ES project? (Imp, Post)
4. How has the ES project changed the way you think about your job or the organisation? (Post)
5. What are some things that you learned about the business processes at the organisation that you did not know before the ES implementation? (Post)

Orientation to Work (process vs. results) – D4

1. In the organisation as a whole, do you think there is a focus on how things are done (process) or the results that are achieved? (ALL)
 - a. To what extent do you think this was important during the ES project?
2. What were the criteria used to determine when goals had been met? (Pre, Imp)
3. How much focus was there on meeting deadlines and finishing the project under budget? (Imp)
 - a. If so, where did this drive come from? Was it from the project leadership or from the organisation's leadership outside the project?
4. How well were project deadlines met? (Imp)
5. When project deadlines were not met, what was the reason? (Imp)
6. Was there a focus on meeting goals, or ensuring that things were done well? (Imp)

Orientation to Collaboration (isolation vs. collaboration) – D5

1. How are projects usually organised at this organisation? Do you tend to do work on a project team or do you primarily work alone on projects? Are teams made up of people from the same functional areas (or departments) or from different functions? (Pre, imp)
 - a. How was the ES project organised?
2. In the organisation, do you think you are more rewarded for individual activities or for work on teams? How important do you think project teamwork is to this organisation? (Pre, Imp)

- a. Do you think there was more or less of a focus on teamwork during the ES project?
3. When people were uncertain about things during the project, how did they seek further input? (Pre, Imp)
 - a. Do you think this attitude was project specific or is this more characteristic of the organisation in general?
4. During the project, how were people at this organisation kept informed about project goals and the progress of the project? (Pre, Imp)
5. Do you think the ES project was seen as simply another IT project? (ALL)

Control, coordination and responsibility (concentrated vs. autonomous decision making) – D6

1. How easy/difficult is it to gain access to people or resources from other areas in the organisation that might be helpful for projects in your own unit/department? (Pre, Imp)
 - a. Did the ES project affect this? Was it easier or harder to gain access to people or resources?
2. Do you think that staff are encouraged to be 'free thinkers' and to find new and creative ways to do their jobs? (ALL)
 - a. Was there a similar attitude during the ES project?
3. To what extent do rules and procedures govern your daily work activities? (ALL)
 - a. Do you think there was more or less of a focus on this during the ES project?
4. How would you describe the structure at this organisation? (e.g. is it primarily decentralised or centralised) (ALL)

Orientation and Focus (internal vs. external) – D7

1. Why did this organisation begin the ES project? (Pre)
 - a. Was it to improve the internal processes of the organisation or due to an awareness of the benefits the ES could bring?
2. How do you think that staff were first informed about opportunities the ES could provide to the organisation? (ALL)
3. How did staff learn about the ES? (Imp)
4. Do you think this learning process occurred throughout the implementation? (ALL)
5. How much did the project rely on outside consultant experience? (Pre, Imp)
 - a. Is this characteristic of the organisation in general? Are outsiders usually sought to help solve problems at this organisation?

Nature of Time Horizon (short term vs. long term) – D8

1. What was the timeline of the ES project? (Pre, Imp)
2. How long was spent planning for the ES project prior to beginning the implementation? (Pre)
3. Was the ES project part of a larger organisational effort? (Pre)
4. What were the goals for the ES project? (Pre)
 - a. What do you think are the current goals for the ES? (Post)
5. What are the primary benefits your organisation wants to realise from the ES? (Pre, Post)
6. To what extent was there a focus on meeting short term goals at the expense of longer term effects? E.g. to what extent were shortcuts made which could have long term effects. (Imp)

General Problems and Successes (if needed)

1. In general, what do you think have been the major organisational challenges, or problems, that were faced during the ES project? (if not already discussed)
 - a. What do you think was the cause of these problems?
 - b. To what extent do you think these problems were overcome?
 - c. Do you think these problems were dealt with effectively? How so?
2. In general, what implementation activities do you think went particularly well? (if not already discussed)
 - a. Why do you think these activities went well?
 - b. Do you think this was due to existing practice/processes at this organisation?

SAP System

1. What do you think about the ES?
2. How would you describe the ES?
3. What do you think are the most important features of the system?
4. What do you think are the worst features of the system? Why do you think this is?
5. Can you describe how you have used the system?
6. How effectively do you think it meets the organisation's needs?

Project Success

1. How successful do you think this project was?
2. Do you think the ES has been a good fit for the organisation?
3. Do you think anything could have been done to better fit the system to the organisation?
4. What was the one thing you would most like to change about this project?
5. Were there any areas of the project you thought could have been done better?

Level 2: Questions asked of the individual case

1. How does organisational culture affect ES implementations?
 - a. To what extent does the organisation's focus on hard data, or personal experience, affect each stage of an ES implementation?
 - b. To what extent does an organisation's focus on internal and external motivation affect each stage of an ES implementation?
 - c. To what extent does an organisation's orientation to change affect each stage of an ES implementation?
 - d. To what extent does an organisation's focus on outcomes, or processes, affect each stage of an ES implementation?
 - e. To what extent does an organisation's focus on collaboration, or individualism, affect each stage of an ES implementation?
 - f. To what extent does an organisation's focus on satisfying external stakeholders, or internal stakeholders, affect each stage of an ES implementation?
 - g. To what extent does an organisation's focus on short-term goals versus long-term goals affect each stage of an ES implementation?
2. How do these organisational culture dimensions affect each implementation stage?

Level 3: Questions asked of the pattern of findings across multiple cases

1. Is there consistency across studies concerning how different organisational culture dimensions affect ES implementations?
2. Can specific organisational culture dimensions be identified in each case study?
3. How does the effect of organisational culture differ across different implementation stages and across different case studies?

Level 4: Questions asked of an entire study

1. How does organisational culture affect ES implementations? (RQ)
 - a. What organisational culture dimensions specifically affect ES implementations?
 - b. What implementation stages are most likely to be affected by organisational culture?

Level 5: Normative questions about policy recommendations and conclusions

N/A

3. Nvivo Screenshot

A screenshot of the tree nodes for the FoodCo case:

Tree Nodes							
Name	Sources	References	Created On	Created B	Modified On	Modified By	
Systems	0	0	21/12/2011 4:48 p.m.	ABC	21/12/2011 4:48 p.m.	ABC	
SAP integration with WMS	1	2	22/12/2011 10:42 a.m.	ABC	14/02/2012 3:01 p.m.	LHS	
New systems	1	2	22/12/2011 10:10 a.m.	ABC	14/02/2012 3:01 p.m.	LHS	
Legacy system	6	6	22/12/2011 10:16 a.m.	ABC	14/02/2012 2:58 p.m.	LHS	
Article master	1	7	22/12/2011 10:21 a.m.	ABC	14/02/2012 3:01 p.m.	LHS	
Stakeholders	1	1	21/12/2011 4:48 p.m.	ABC	30/01/2012 4:35 a.m.	LHS	
Suppliers	3	4	21/12/2011 4:53 p.m.	ABC	10/02/2012 2:47 p.m.	LHS	
Steering committee	1	1	20/02/2012 3:11 p.m.	LHS	20/02/2012 3:12 p.m.	LHS	
Retail	3	6	2/02/2012 9:00 a.m.	LHS	10/02/2012 2:34 p.m.	LHS	
IT director	1	1	31/01/2012 6:56 a.m.	LHS	31/01/2012 6:56 a.m.	LHS	
The board	1	2	21/12/2011 4:53 p.m.	ABC	21/12/2011 4:53 p.m.	ABC	
The board	2	4	30/01/2012 5:34 a.m.	LHS	17/08/2013 1:17 p.m.	LHS	
FoodCo	3	9	22/12/2011 10:09 a.m.	ABC	17/08/2013 1:17 p.m.	LHS	
Corporate executive	4	6	21/12/2011 4:53 p.m.	ABC	14/02/2012 2:39 p.m.	LHS	
Coop members	6	22	31/01/2012 7:30 a.m.	LHS	14/02/2012 10:53 a.m.	LHS	
CEO	1	2	2/02/2012 8:42 a.m.	LHS	2/02/2012 8:53 a.m.	LHS	
Business process owners	3	8	1/02/2012 11:37 a.m.	LHS	7/02/2012 11:02 a.m.	LHS	
Administration department	1	3	1/02/2012 3:58 a.m.	LHS	14/02/2012 2:55 p.m.	LHS	
Project phases	0	0	21/12/2011 4:47 p.m.	ABC	21/12/2011 4:47 p.m.	ABC	
Shakedown stage	2	2	21/12/2011 4:49 p.m.	ABC	7/02/2012 11:10 a.m.	LHS	
Project stage	3	4	21/12/2011 4:49 p.m.	ABC	10/02/2012 2:46 p.m.	LHS	
Onwards and upwards stage	1	1	21/12/2011 4:49 p.m.	ABC	31/01/2012 7:11 a.m.	LHS	
Misc factors	0	0	31/01/2012 7:18 a.m.	LHS	31/01/2012 7:18 a.m.	LHS	
Chartering stage	0	0	21/12/2011 4:49 p.m.	ABC	21/12/2011 4:49 p.m.	ABC	
Organisational culture dimensions	0	0	21/12/2011 4:47 p.m.	ABC	21/12/2011 4:47 p.m.	ABC	
Orientation to work	12	62	30/01/2012 5:17 a.m.	LHS	10/07/2012 7:01 p.m.	LHS	
Orientation to collaboration	11	47	21/12/2011 4:48 p.m.	ABC	4/07/2012 3:11 p.m.	LHS	
Orientation to change	12	67	30/01/2012 4:40 a.m.	LHS	25/06/2012 10:01 a.m.	LHS	
Orientation and focus	12	51	30/01/2012 4:52 a.m.	LHS	26/07/2012 10:13 a.m.	LHS	
Nature of time horizon	10	35	21/12/2011 4:54 p.m.	ABC	9/07/2012 4:03 p.m.	LHS	
Motivation	9	40	30/01/2012 5:27 a.m.	LHS	9/07/2012 11:37 a.m.	LHS	
Control and coordination	12	61	30/01/2012 5:37 a.m.	LHS	28/11/2012 11:04 a.m.	LHS	
Basis of truth and rationality	12	47	21/12/2011 4:48 p.m.	ABC	10/07/2012 6:46 p.m.	LHS	